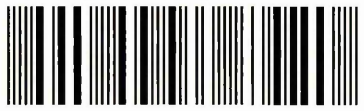

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Framework for an Analytical-deliberative Process for Municipal Waste Management Decision Making

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Abstract

Local authorities need to find more effective ways to involve stakeholders and communities in decision-making since public acceptance of municipal waste facilities is integral to delivering effective waste strategies. This study explores the potential for adopting an analytical-deliberative process in a UK waste management context. It addresses questions of perception, interests, the decision context, the means of engagement and the necessary resources and capacity for adopting an iterative decision process. A mixed methods approach was used to gather empirical data through combined interviews and questionnaires with local authorities, waste industry experts, government officials and regulators, environmental campaigners and other community groups. The main output from the research is an empirical framework which captures and builds on theories of public involvement and the experiences of practitioners, and is intended to offer guidance for integrating analysis and deliberation in different waste management situations. The framework includes guidelines for greater inclusivity in decisions on contentious technologies or where there are high levels of uncertainty regarding the outcome of decisions.

The empirical findings reveal that one of the more fundamental challenges to adopting an analytical-deliberative process in a UK waste management context is creating effective dialogue in a regulatory culture where participatory democracy is not the dominant political ideology. This appears to be more significant at the strategic planning level, where past institutional assumptions about public ignorance and incompetence may still hold, posing important methodological challenges to adopting analytical-deliberative processes. At the facility planning stage, there is greater awareness (among local authorities) of the benefits of analytical-deliberative structures. These benefits are associated with greater opportunities for trading-off impacts to the local community, thus addressing concerns around perceptions of social equity, fairness and legitimacy of the decision process. Overall, the research reveals the importance of engaging different stakeholders early in the decision process, specifically where issues are contentious or uncertain, to obtain a better understanding of decision needs and establish appropriate rules for successful public involvement.

Acknowledgements

Look at a stone cutter hammering away at [her] rock, perhaps a hundred times without as much as a crack showing in it. Yet at the hundred-and-first blow it will split in two, and I know it was not the last blow that did it, but all that had gone before. ~ Jacob A. Riis

This is a fitting quotation that reflects what has been a long and arduous journey; a steep learning curve that has taught me the 'real' meaning of commitment, dedication and perseverance. It is important that I acknowledge the personal and practical support of a number of people that have helped me along this journey. My deepest gratitude is extended to my family for their love, encouragement and prayers over the years, my supervisors for their help and guidance, my friends and colleagues for their moral support and enlightening conversations about research, and most importantly for the strength, courage and resilience gained through the prayers of many and my faith in almighty God.

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The end has come but forever the journey is imprinted in my mind
– 'gwaan an brawl nah gal'!

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Chapter 1: Introduction

The overarching goal of this research is to understand what opportunities exist for expanding public involvement during the development of municipal waste management strategies and facility plans. The focus is on issues related to the selection of technologies and sites for waste treatment and disposal facilities where expert opinion on scientific and technical matters has traditionally been the foundation of decisions but, more recently, have created problems related to the legitimacy of waste management decisions.

The propensity towards special interest capture and bureaucratisation as the reality of public involvement illustrates a general failure to communicate information effectively to the public or wider problems in decision processes that either exclude the public from decision-making or involves them too late (Rydin and Pennington 2000; Petts 1994). In the English waste policy context there is support for public involvement at the early stages of decision-making through effective deliberative and participative systems of governance at all levels of society (HMT 2005). However, there is a need to assess the level and mode of participation necessary in relation to the decision context, and to assess the suitability of deliberative and participatory methods within existing regulatory and institutional regimes (including constraints such as time, resources and information requirements). In this regard, the question this research attempts to answer is **"how can an 'analytical-deliberative' process be used successfully to integrate public values into technical analysis of options for municipal waste management, given the nature of the waste problem and the social context in which public involvement initiatives may take place?"**

This chapter provides a background for the study, sets the scene for the research, develops the aims and objectives, clarifies the contribution to knowledge and provides an outline of the thesis.

1.1: Background to the research

Industrialised economies are facing ever increasing loads of municipal waste and declining landfill space to dispose of this waste. The challenge for coming decades is

to minimise its impacts on the environment in an economically and socially acceptable way. Making sure that waste will not pose a hazard for coming generations is as much part of the problem as making sure resources will not be depleted at a rate which cannot be sustained. Municipal waste management is therefore an important area for finding sustainable solutions, which at the moment, point towards achieving high recycling (and composting) efficiency, energy recovery and disposal (Ernst and Young 2009).

In the past, the UK has been heavily reliant on disposal to landfill as a primary means of handling municipal waste (Environment Agency 2008) but the EU Landfill Directive, implemented in England in 2002, has subsequently changed the focus of UK waste policy. Statutory targets introduced by government for the diversion of biodegradable waste from landfill and the recovery of materials through recycling/composting, coupled with the high costs of landfill, is driving local authorities to seek alternative waste management options. As policy and fiscal measures reduce landfill and increase levels of recycling/composting, energy-from-waste (EFW) incineration continues to play a limited role in local waste management policy (Table 1.1).

Table 1.1: Municipal waste management in England (1995/96 – 2009/10)

Municipal waste management statistics (percentage (%) of total waste generated)	1995/96	2003/04	2009/10	Changes between 1995/96 and 2009/10
Landfill	83.5	72	47	- 36.5
Incineration with EFW	4	9	13.6	+ 9.6
Incineration without EFW	4.5	-	-	- 4.5
Recovery through recycling / composting	7	19	39.7	+32.7
Other	1	-	1	0

Source: Defra (2011a; 2005i; 1997)

Controversy concerning the location of municipal waste treatment and disposal facilities, not least the discussion on the need for such facilities, particularly EFW incineration plants, is widespread across the UK. Proponents (both public and private) of these facilities point to the need for them and their technical suitability, while opponents (experts, environmental groups and local communities) emphasise the risks on health and the environment, associated with the substances to be disposed of or treated by the process (Dente *et al.* 1998). In the UK, social acceptance problems associated with siting waste facilities have caused delays and,

in some cases, the need to abandon facility proposals (Petts 2004; 1992; Furuseth and O'Callaghan 1991).

Implementing and siting EFW facilities in particular has proved problematic because citizens have associated these facilities with a variety of social, economic, political and legal concerns (e.g. health risks, reduction of property value and community attractiveness, poor facility control and operation) (Elliot 1998; Petts 1992). For example, in 2001, the environmental campaign group Greenpeace occupied an EFW facility in Sheffield for a period of three days claiming it had 'an appalling criminal record' (Figure 1.1). The protestors accused the operator of 'toxic crimes' and pledged to fight against proposals for new incineration facilities in Sheffield and across England (Greenpeace 2002; 2001).

Figure 1.1: Campaign against the Bernard Road incinerator, Sheffield

Campaigners painted the phrase and 'toxic crime' on Sheffield's 75 feet high incinerator chimney

Local Sheffield resident showing support for the campaign

Campaigners climb to the top and occupy the incinerator chimney

Source: Greenpeace (2002)

Similar opposition have occurred in Nottingham (Eastcroft incinerator), Enfield (Edmonton incinerator), Kent (Belvedere incinerator) and other locations across the UK. Public opposition to EFW facilities is usually associated with atmospheric pollution, health risks and amenity impacts (e.g. dust, noise, litter, vermin, flies, low property prices and disturbances from traffic) that are geographically concentrated, while the benefits accrue to a larger, more dispersed population. The localised negative impacts make opposition by local residents understandable and are indicative of why such intense, sometime emotive, responses to siting proposals have occurred (Davis and Lester 1988).

Some studies have shown that even proposals for relatively benign bottle banks and recycling centres attract public opposition (e.g. Cullen 2002 in Davies 2003). In fact, most waste management facilities are opposed by the public often resulting in delays in gaining planning approval, and in some instances, refusal of planning applications (Section 2.4.1). For example, public opposition to facilities has occurred in Leicester (composting facility) and Milton Keynes (mechanical biological treatment and material recycling facilities) (Coggins 2004).

There are similar experiences of public opposition to other types of developments including wind farms (Wolsink 2000), private and social housing, new roads and supermarkets (The Saint Consulting Group 2009). More generally, public opposition may be linked to people embracing new environmental values along with the fear of technological risks such as hazardous waste, toxic substances and nuclear waste (Slovic 1987). It may also be associated with the significant increase in publicly available information on health and environmental risks of proposed facilities, where concerns around waste-related exposure raise questions of environmental justice (Martuzzi and Forastiere 2010). Other factors include a decline in confidence in government and industry to make informed and equitable decisions about risky technologies (Chapter 3), as well as the statutory creation of more opportunities for public involvement in waste strategy development and facility planning (Chapter 2).

This wide-spread opposition to a range of waste facilities such as EFW incinerators, landfills and material recycling facilities exposes a weakness in approaches taken by local authorities to effectively balance regional needs with local impacts (Morrell and Magorian 1982). Petts (2003) suggests the degree of public opposition to waste facilities, and local authorities' recognition that the traditional paternalistic approach to policy and plan development may be promoting such problems, has driven local authorities to try more innovative deliberative and participatory methods (see also Petts 2001; 1997). However, public participation exercises in local authorities still focus on the use of traditional methods which are not appropriate for the controversial nature of waste management decisions, and not suitable for an educated, sophisticated and less deferential public (Albeson *et al.* 2003; O'Hara 1998; Inglehart *et al.* 1996). Hence it is suggested that the public ought to be involved from the onset of the decision-making through deliberation in an

assessment process that informs and influences the decision outcome (European Commission 2004; Petts 2003; House of Lords 2000; ILGRA 1998; RCEP 1998).

1.2: Setting the scene

The potential to enhance public involvement in science policy has been addressed for over two decades (van Asselt and Rotmans 2002; Jansonoff and Wynne 1998; Kuper 1997; Stern *et al.* 1992). Traditionally, the scientific community focused on education of the public and produced 'deficit models' of public risk understanding, which emphasised the need to communicate risks to citizens by educating them on issues of 'real' importance and correcting any misperceptions and misunderstandings. However, there is now support for greater two-way communication (Wynne 1991). For instance, the UNECE Convention[1] links environmental and human rights, government accountability and environmental protection, and puts forward a new democratic process where public participation in the negotiation and implementation of international agreements is viewed as key to achieving sustainable development.

The local government 'modernisation' agenda has considered aspects relating to public participation, council decision-making and wider governance as key components in a programme for the democratic renewal of local government (DTLR 2001,1998). The Royal Commission on Environmental Pollution (RCEP) (1998) and the House of Lords Select Committee on Science and Technology (2000) have been influential voices in support of wider engagement. RCEP argued that there is a need to ensure that people's values, alongside local knowledge and understanding, are articulated and taken into account along with technical and scientific considerations. It was concluded that this would be the only way by which legitimate, differing concerns and perspectives could be addressed. The Select Committee talked about direct dialogue with the public becoming a normal and integral part of science-based policy-making. A new conceptualization of the relationship between science and

[1] The United Nations Economic Commission for Europe (UNECE) Convention on Access to Information, Public Participation in Decision making and Access to Justice in Environmental Matters was adopted by the UK in 1998 and ratified in 2005.

politics, whereby there is some balance in the use of expert and local knowledge, is required to legitimise waste policy decisions.

The technical expertise politicians relied on in the past, to produce cost-effective and environmentally sound solutions, no longer provides sufficient justification to approve waste facilities. A decision process based on more deliberative and participatory procedures is more likely to evoke motivation to engage in decision-making, broaden the basis of knowledge and values involved, initiate learning processes, produce new possibilities for conflict resolution, realise common interest, and increase the acceptance and legitimacy of a decision (Joss and Bellucci 2002; Durant 1999; Fischer 1999). The analytical-deliberative process defined here as an iterative communication process that integrates public values into technical analysis of options has proven successful in the US and Western Europe for improving public trust and confidence in the development of policies of complex environmental issues (Chapter 3). This approach defines new bases for acceptable decisions which supplement the traditional technical 'rational' grounds on which decision are made.

Waste management facilities now need to be understood in the context of significant changes in the conduct of public affairs at international, national and local levels. The Aarhus Convention (1998) established a principle of open communication between government and citizens, and sought to engage greater involvement at all stages of environmental decision-making. The European Union (EU) Directive providing for public involvement in the development of plans and programmes[2] implements this objective and seeks meaningful and continuous engagement on issues relating to Municipal Waste Management Strategies (MWMS) and Local Development Documents (LDD). Mechanisms such as Strategic Environmental Assessments (SEA)[3], Statements of Community Involvement (SCI)[4] and

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[2] Directive 2003/35/EC is being implemented in part through amendment of the Environmental Impact Assessment (EIA) Directive, the Integrated Pollution Prevention and Control (IPPC) Directive and principles already embedded in the Strategic Environmental Assessment (SEA) Directive.
[3] The EU Directive 2001/42/EC (the SEA Directive) promotes innovative and active involvement of stakeholders from the early stages of the MWMS development and throughout its development thereafter.
[4] The Planning and Compulsory Purchase Act 2004 introduced the requirement for each local planning authority to produce a SCI to set out how communities will be engaged in the preparation of LDD and consideration of planning applications (ODPM 2004a).

Sustainability Appraisals (SA) have driven local authorities to pursue more and better engagement and helped to structure the way that people are involved.

The strengthening framework for public involvement and the action being taken to support this, through a wide range of policies, initiatives and legislation, have a broad focus on community planning, access to information, opportunities for public participation, rights for redress, and impact on community involvement in planning (ODPM 2004b). The UK government has set requirements for the consideration of alternative waste management options in a systematic way - effective community engagement has been put forward as an important and integral part of the decision-making process; the assessment of environmental impacts of possible options must now consider both long and short-term environmental and socioeconomic objectives; and local authority decisions will have to deliver options that reduce the environmental impact of waste and protect human health and the safety of the environment (Defra 2005a; ODPM 2005b). Government's guidance on public involvement is based on communicative partnerships between different interest groups who have (or may have) a stake in the issue with specific commitment given to the redress of environmental and social inequalities (Morphet 2008; Pratchett 2000; Stoker 1998; Dryzek 1990).

A few local authorities have responded to regulatory requirements by testing participatory methods such as citizen juries, community advisory groups or committees and consensus panels as part of waste policy and strategy development (Petts 2004). However, decision-making policy based on relatively passive involvement through opinion polls, service satisfaction surveys, consultation documents and public meetings is still the norm in local government (ODPM 2002; Petts 2000). These traditional approaches sometimes fail because public participation has been limited to 'the public right to know', 'informing the public' and the 'public right to object'. The ability to define interest, identify the actors, determine the agenda, assess risks, recommend solutions and take part in the final decision has not been open to the community or the public at large (Wiedemann and Femers 1993). Scientific evidence and expertise are essential in relation to certain technical elements of the debate (e.g. heath risks associated with emissions from landfills or incinerators) but local experiences and anecdotal knowledge are relevant to others

(e.g. economic, management and operational aspects) (Petts, 1997). Risk decisions (i.e. problems related to technological or social hazards and other controversial issues) must take account of expert as well as public knowledge to be considered effective and acceptable to the range of interested and affected parties. Such decisions should be based on analytical-deliberative process (Stern and Fineberg 1996) - the integration of technical analyses of, for example, waste management options with an assessment of social impacts, within an explicit decision-making model with clear criteria, and involving stakeholder and public consultation and participation, in contrast to the more traditional top-down approach (Culyer 2005; Petts 2004; Stern and Fineberg 1996).

The main focus of past research has been on risk communication and, more recently, mechanisms for involving the public at higher levels in decision-making (e.g. Petts 2000; Renn 1998). More attention is now being paid to public understanding of the practices of science, in particular to public views on the institutional structure of science and the motivations behind claims to expertise and trust in science (Sturgis and Allum 2004; Bauer *et al.* 2000). In the past, studies have been conducted on the best way to present information (Golding *et al.* 1992), the best medium for transmitting information to a target audience (Chipman *et al.* 1996) and the relevant people to whom to impart such information (Frewer *et al.* in Rowe and Frewer 2000). Other studies have focused on the requirements for deliberative democracy (based on two-way communication between decision makers and the public) (Tuler and Webler 1999; Cohen 1989; Stern and Fineberg 1996). Petts (1997) suggests few studies have been conducted to understand what happens at the interface between 'expert' and 'public' in the waste management context to make the processes for public involvement and communication fair and competent. She concludes there is a need to see whether the actual activity of interfacing or interacting can mediate between different interests and be adapted to improve the management of disputes and promotion of consensus. Chilvers (2007) suggests the evaluation of processes and outcomes of public involvement initiatives (and the link between them) is also necessary if claims about process (in)effectiveness are to be verified, and practitioners to gain a systematic understanding of the required nature, extent, and synthesis of analysis and deliberation in different decision contexts.

The major challenges faced are how to conceptualize unknowns, the limits of available scientific knowledge, the cognitive biases inherent in technical analysis, and thus the terms for wider public involvement in such judgments. One mechanism for addressing these challenges is to recognize the need to design and implement deliberative and participatory processes which are 'fit-for-purpose': relevant to the decision situation and context, easily integrated within decision-making structures, and negotiated within existing constraints such as time and resources and information requirements (Burgess *et al.* 2004; Petts and Leach 2000).

1.3: Aims and objectives

The aim of the research is to establish stakeholders' opinions on the need for, and barriers to, an analytical-deliberative process for municipal waste management decision-making. The focus is on waste policy affecting the development of local waste strategies and facility plans and specifically on decisions related to the selection and installation of waste treatment and disposal facilities, particularly controversial ones such as EFW incineration. The research objectives are defined below to highlight the focal points of the study, and the natural progression of the work.

1. To assess regulatory and institutional mechanisms and social and economic pressures to improve public involvement in the development of local waste management policy and plans.

2. To review the theoretical bases and political structures supporting a more deliberative and participatory approach to environmental policy development, internationally and in the UK.

3. To assess the factors that could define the effectiveness of integrating analysis and deliberation in decision-making, and to discuss practical issues affecting implementation of analytical-deliberative processes, drawing upon evidence of its use to resolve environmental conflict.

4. To examine the socio-technical nature of the waste management problem and generate a typology of variations in perceptions of waste issues by exploring how these are framed by industry experts, policy makers and interested and affected citizens, and how the different values, ethics and judgements of groups underpin their opinions and attitudes to early public involvement.

5. To clarify the opportunities for, and barriers to, adopting an analytical-deliberative approach in a UK waste management context, building on existing research and integrating the views and opinions of stakeholders to draw out key principles.

6. To produce a framework for negotiating the level and mode of public involvement and the extent of deliberation in different waste management decision contexts.

7. To outline future opportunities for building upon the research outputs.

The research addresses stakeholders' views in relation to two broad themes: (a) commonly held perceptions of the waste problem, (b) opinions and attitudes to early public involvement. The approach adopted includes:

- a qualitative study involving a series of interviews with key informants and other stakeholders across the waste sector
- a survey of perceptions of the waste problem and opinions and attitudes to early public involvement from stakeholders across the waste sector
- the combination of qualitative and quantitative data to provide insights into the issues and create a rational basis for discussion and recommendations (Chapter 4)

1.4: Contribution to knowledge

The research contributes to previous theoretical work by establishing an empirical framework for negotiating the level and mode of public involvement in relation to the nature of the waste management problem and the decision context. The

framework captures and builds on theories of public involvement and the experiences of practitioners to offer guidance for integrating analysis and deliberation in different waste management situations. Much of the emphasis is placed on the context in which deliberative and participatory methods are likely to be effective, clarifying the means to achieve successful public involvement. Recommendations for negotiating the level and mode of public involvement in different situations are made in order to contribute to improvements in the transparency, consistency and acceptance of waste management decisions, and overall to general knowledge in the field of public policy.

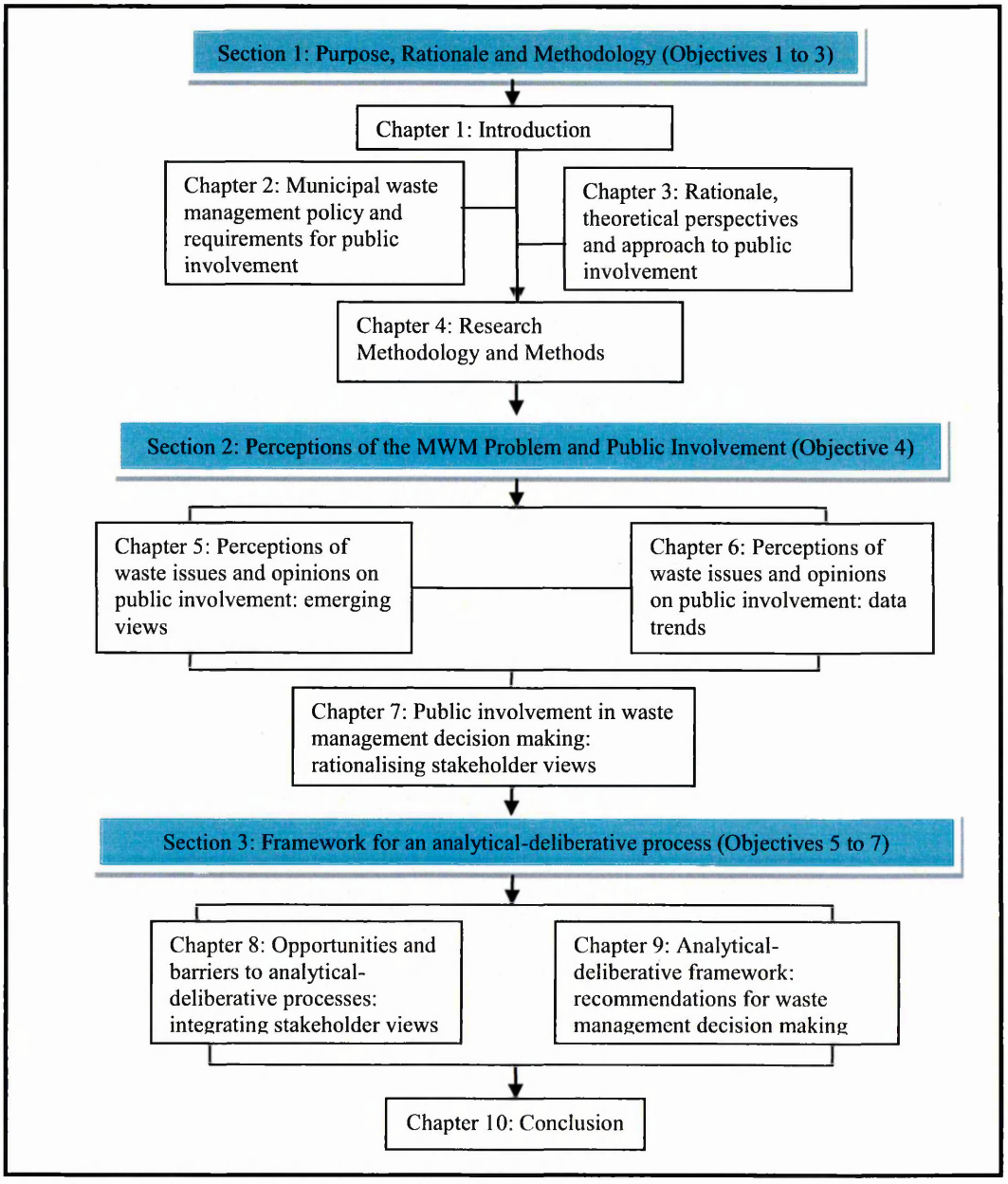
1.5: Structure of the thesis

The research is developed in three sections (Figure 1.2). The first reviews the development of municipal waste management policy in the UK, with particular reference to the need for a more fundamental constructive engagement with communities and stakeholders during the development of waste management strategies and facility plans. The main issues relating to public involvement, particularly in environmental policy, are drawn out to set a theoretical context for the research. It addresses practical questions of why and how these methods are used in environmental decision-making and what factors appear to influence their success. Connections between the research methods, the theoretical framework and the analytical approach are discussed to explain the philosophical assumptions inherent in data analysis and interpretation.

The second section employs a modified version of 'soft systems methodology' (Checkland 1981) to explore the socio-technical nature of the waste management problem and generate a typology of variations in perceptions of waste issues, and opinions and attitudes to early public involvement. Stakeholder views are examined to gain an understanding of the different perspectives of participants, particularly where common associations are revealed, so as to rationalise and justify differences between groups. It addresses questions of perception, interests, the decision context, the means of engagement and the necessary resources and capacity for adopting a more iterative decision process.

The final section explores the opportunities for, and barriers to, an analytical-deliberative process and provides a theoretical-oriented framework for negotiating the mode and level of public involvement in different waste management contexts. It addresses questions of 'who to involve', 'at what level', 'what methods to use' and 'how to ensure engagement is suited to the decision context'. The thesis concludes with a reflection on the aims and objectives of the study to demonstrate how the findings respond to the research question and offers suggestions for further development of the work.

Figure 1.2: Structure of the thesis



Chapter 2: Municipal Waste Management Policy and Requirements for Public Involvement

This chapter outlines the development of local waste management policy in the UK, with particular reference to government guidance for 'early public involvement'. It identifies the principles for waste management in the wider context of sustainable development, and then reviews the phases in development of municipal waste management policy, focusing on the influence of a changing regulatory environment on policy drivers at the national and international level. It also provides an overview of the institutional structures and responsibility for municipal waste management with reference to the public's role. It then outlines a number of alternative waste management options to landfill and discusses the issues and challenges of adopting these technologies in relation to sustainable practice and public acceptance. The level of uncertainty inherent in developing waste strategies is then identified, focusing on the ability of analytical tools to deal with social values and other areas of contention. The final section outlines procedures for developing municipal waste management strategies and facility plans, summarising statutory guidelines that dictate minimum requirements for public involvement with a reflection on the level of public involvement expected of local authorities.

2.1: Sustainable waste management

The increasing amounts of waste being generated as a consequence of rapidly growing economies mean waste management is emerging as a significant and highly controversial socio-economic and environmental issue (EEA 2005; Schmidt-Bleek 1999). Hence waste management needs to be considered in the wider context of sustainable development "...meeting the needs of the present generations without compromising the ability of further generations to meet their own needs" (WCED 1987; p.8). The concept of sustainability encompasses environmental, social and economic dimensions (Table 2.1). These imply that new strategies and methods for solving problems must not only address environmental and economic aspects but also the social aspect. Therefore, if the social consequences of strategies and solutions are neglected, it is likely the successful implementation may suffer from a lack of public or social acceptance. In this context, sustainable waste management is

interpreted as the need for policy makers to: (1) minimise the impact on the environment in an economically and socially acceptable way and, (2) make sure that natural resources are not depleted at a rate which cannot be sustained (Defra 2007a; DTLR 2000).

Table 2.1: Sustainability objectives

- ***Living within environmental limits***: respecting the limits of the planet's environment, resources and biodiversity – to improve the environment and ensure that the natural resources needed for life are unimpaired and remain so for future generations.
- ***Ensuring a strong healthy and just society***: meeting the diverse needs of all people in existing and future communities, promoting personal wellbeing, social cohesion and inclusion, and creating equal opportunities for all.
- ***Achieving a sustainable economy***: building a strong, stable and sustainable economy which provides prosperity and opportunities for all, and in which environmental and social costs fall on those who impose them (polluter pays), and efficient resource use is incentivised.
- ***Using sound science responsibly***: ensuring policy is developed and implemented on the basis of strong scientific evidence, whilst taking into account scientific uncertainty (through the precautionary principle) as well as public attitudes and values.
- ***Promoting good governance***: actively promoting effective, participative systems of governance in all levels of society – engaging people's creativity, energy, and diversity.

Source: HMT (2005; p.16)

The National Waste Management Strategy in 2007 (Defra 2007a) reaffirmed the key objective of waste policy is to move waste management 'up the hierarchy'. The principles of 'self sufficiency' and 'proximity' in Waste Strategy 2000 (Table 2.2) have been reformulated and are now set out as objectives to be delivered at regional and local planning levels where communities are able to take more responsibility for their waste (self sufficiency) and ownership of facilities (proximity). There is also a focus on integrating the social dimension into processes for decision-making, planning and problem solving (through higher levels of public involvement) to reflect the concerns and interests of communities in the development of waste strategies and plans.

Table 2.2: Principles for sustainable waste management

- ***A preferred hierarchy of waste management options*** where waste reduction or minimisation, re-use, recycle or composting are recognised as the most preferred options. At the lower end of the hierarchy and considered the least preferred options are energy recovery and final disposal to landfill (p. 42).
- ***The self sufficiency principle*** implies that individuals, communities and organisations should take responsibility for their waste (p.42).
- ***The proximity principle*** implies that waste should be disposed of as close as possible to where it is produced by means of the most appropriate methods and technologies. This means local communities would have to accept the need to build waste facilities close to the point where waste is generated (p. 42).
- ***The polluter pays and producer responsibility principles*** applies to those who contaminate the environment or puts products on the market and establishes responsibility for them to pay the full costs of their actions including when the products become waste (p. 43).
- ***The precautionary principle*** shows a willingness to take action in advance of scientific proof of evidence of the need for proposed action on the grounds that further delay would prove ultimately more costly to society and nature, and in the longer term, selfish and unfair to future generations (p. 14).

Source: DTLR (2000)

2.2: Municipal waste management policy in the UK

In the UK, municipal waste raises particular difficulties for sustainable management because the waste is heterogeneous and multi-sourced - it has a lower rate of reuse and recycling/composting on average, compared to other waste streams. Although municipal waste represents only 7% of approximately 450 million tonnes of waste generated in the UK annually, it attracts widespread political and public attention as an issue that is representative of the wider concern of resource efficiency and environmental protection (Bulkeley *et al.* 2005; 2004).

The term municipal waste generally refers to waste collected by or on behalf of municipalities where the bulk of this waste stream is from households, though similar waste from sources such as commerce and trade, office buildings, public institutions and small businesses are often included (EEA 2005). The UK Government's view is that the definition of municipal waste in the EU Landfill Directive encompasses all waste under the control of the local authorities, be they waste disposal, waste collection or unitary authorities (Defra 2006d). Statistics on municipal waste management in England for 2009/10 show that approximately 47%

of municipal waste was sent to landfill, 39.7% recycled and composted, and 13.6% incinerated in energy from waste (EFW) facilities (Defra 2011a). However, Defra's decision to change the way 'municipal waste' is defined, incorporating non municipal fractions (e.g. construction and demolition waste) as well as most of the existing local authority collected waste, could see future changes in the way municipal waste is reported in policy and statistical terms (Defra 2011b).

A range of statutory targets and indicators for waste management performance, based on EU legislation, are shaping the framework for waste policy. These have both defined and reduced environmental risks and liabilities associated with waste management options by promoting the concept of the waste hierarchy with the aim to move away from the idea of 'end-of-pipe' waste management towards a more holistic resource management. However, the continual reshaping of waste policy by European legislation and policy innovation at the national level has introduced uncertainty about goals and priorities for waste managers (Bulkeley *et al.* 2005).

The gradual change in focus to environmentally sound waste management has served as a driver for local authority cooperation in recognition of the benefits of economies of scale (House of Commons 2007). In the last two decades there has been a general realisation that a more integrated approach to waste management policy was required. The integrated policy approach looks at the political, institutional, social, economic and financial alongside the technical and environmental aspects. A key international driver that emerged as a result is the concept of extended producer responsibility, which involves producers being accountable for the environmental impact of their products throughout their life, and in particular taking financial responsibility for the collection, recycling and safe disposal of these products at end-of-life (Wilson 2007).

The producer responsibility concept is driving changes in waste management (Defra 2006b). The most influential economic driver has been the landfill tax, implemented by the UK Government under the Landfill Allowance Trading Scheme (LATS). In 2007, the landfill tax escalator was increased from £3 to £8 for active waste (those that give off emissions – i.e. biodegradable municipal waste) – this means that the cost per tonne of disposal would increase to £54 by 2010/11. Under the terms of the

1999 Landfill Directive, local authorities must reduce the volume of biodegradable municipal waste (BMW) sent to landfill (based on 1995 levels) by 75% in 2010; 50% in 2013; and 35% in 2020. Failure to meet this requirement will result in a LATS fine of £150 for every tonne of BMW sent to the landfill above and beyond the allowance for that authority.

The UK Government extended the terms of the Directive and set statutory targets for the diversion of materials from the waste stream and recovery of waste from landfill. The *Waste Strategy 2007* set higher statutory targets for recycling / composting (at least 40% by 2010; 45% by 2015; 50% by 2020) and national targets for the recovery of municipal waste (53% by 2010; 67% by 2015 and 75% by 2020) (Defra 2007a). It introduced new targets for the reduction of waste not reused, recycled or composted (i.e. residual waste) based on 2000 levels – 29% in 2010; 35% in 2015; and 50% in 2020. This is equivalent to a fall of 50% per person (from 450 kg per person in 2000 to 225 kg in 2020 (Defra 2007a; p. 11). However, Defra's decision to incorporate commercial waste arisings in the amount of waste counted as municipal waste is set to bring the UK more in line with European Union thinking and lead to changes in the baseline projections and targets for landfill diversion in 2010, 2015 and 2020 (Defra 2011b).

Significant change to reduce the amount of municipal waste produced and to increase the amount of BMW diverted from landfill is necessary for local authorities in England to meet all three of the Landfill Directive targets. Trading alone is unlikely to enable authorities to meet their allocations, where research (Environment Agency 2008) suggests that about 71 out of 121 waste disposal and unitary authorities in England will need to take immediate action to meet their landfill allowance in 2010[5]. For many local authorities, failure to meet targets under the Landfill Directive will result in fines of several hundred thousand pounds per annum and in extreme cases (where local authorities are doing nothing to reduce waste to landfill) fines will extend to millions of pounds per annum (COSU 2002). For this

[5] Environment Agency (2008) *Report on Landfill Allowances and Trading Scheme 2007/2008*: In 2007/08, the calculated amount of BMW sent to landfill in England was 10,581,953 tonnes. In target year 2009/10, the amount of BMW that can be sent to landfill is 11,200,000 tonnes.

reason, most of the waste strategy work carried out by local authorities, until recently, has focused on the need to reduce municipal waste to landfill. Their vision of progress in waste management has been conditioned by statutory targets but this has come under criticism.

The comparatively poor use of sustainable waste management options, defined in terms of the waste hierarchy which seek to reduce, re-use and recycle waste as a priority, can be attributed to past circumstances and policy choices (Bulkeley *et al.* 2005; Davoudi, 2000; Gandy 1994). Slater *et al.* (2007) suggests Government priorities are driving waste management towards the achievement of national targets and efficiency savings rather than wider sustainable waste management objectives, which includes reducing levels of waste throughout the supply chain and managing the waste that is produced more sustainably. While targets are designed to fulfil international obligations, pragmatic pursuit of targets by local authorities does not necessarily promote the most sustainable practices, even though targets themselves are in dispute (COSU 2002). It remains unclear whether the strategies and targets put in place by the government are able to deliver a more sustainable approach to municipal waste management policy (Bulkeley *et al.* 2005).

Commentators from the waste industry (e.g. CIWEM 2010) suggest Defra's review of England's waste management policies is timely and well received in light of the challenges facing the waste industry, specifically future infrastructure needs, better communication with consumers and a wider focus that embraces commercial and industrial waste. Defra's waste review consultation document supports more sustainable waste management policies that values waste as a resource. It includes plans to establish incentive schemes, behaviour change programmes and responsibility deals that encourage householders and businesses to reduce and recycle waste, along with proposals to accelerate the take-up of anaerobic digestion technologies that generate energy from waste (Defra 2010a).

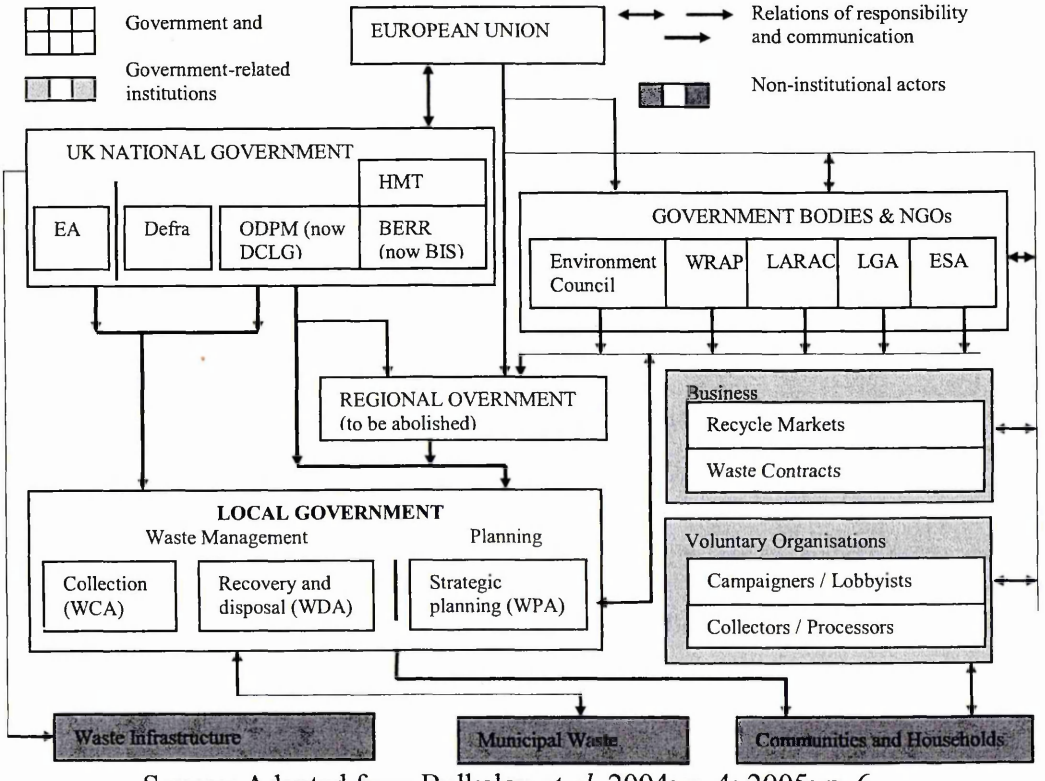
There are however, multiple risks associated with the review's objectives, particularly in a climate where planning and policy delays are hindering development and implementation of waste management infrastructure. There are concerns that the Government's aspiration for a 'zero waste economy' (Spelman in

Defra 2010b) is based on an unattainable aim of 'zero landfill'. The Royal Town Planning Institute (RTPI) (2010) suggests a more honest and transparent waste strategy is needed that reflects an economy which values waste as a resource. They stated the national waste strategy must be based on attainable targets such as efficient use of resources and minimal disposal. CIWEM (2010) felt in the current financial climate, waste management objectives ought to prioritize maximum economic benefit, energy production or avoided energy use and needs within the framework of the waste hierarchy and life cycle thinking. Aligning waste policies with production and consumption policy is seen as a significant step in achieving the integrated policy framework, implicit in the delivery of the review's objectives (SITA 2010; RTPI 2010; CIWEM 2010).

2.3: Institutional and non-institutional structures and responsibility for waste management

Municipal waste management has historically been the responsibility of local authorities in the UK, with only a broad legislative context set from any higher level of government (Figure 2.1).

Figure 2.1: Key institutions and relationships in municipal waste policy



Source: Adapted from Bulkeley *et al.* 2004; p. 4; 2005; p. 6

Locally elected politicians influence the overall direction of the waste policy and often have core responsibility for setting the agenda for local decision-making. Although the waste planning authorities assess planning applications and control waste management facilities through the planning system, local politicians can potentially undermine these decisions if their support is not solicited during the decision process. The actions of local authorities and their electorate are held to account by a separate Executive and Overview and Scrutiny committee within councils. The Overview and Scrutiny committee has the power to inspect proposals during policy development and to undertake reviews of particular aspects of council service or operation with the aim of influencing decisions taken by council Executives.

Local authorities are independent and autonomous bodies answerable to the local electorate as well as to central government with a wide range of responsibilities that relate to waste management. There are three distinct roles for local authorities in the management of waste: waste planning, waste collection and waste disposal. Waste planning authorities include County, Metropolitan and Unitary authorities who have split responsibilities including: (a) planning control over waste management and land use (waste planning authority - WPA), and (b) treatment and disposal of County controlled waste (waste disposal authority -WDA). Waste collection authorities (WCAs) include Metropolitan, Unitary and District authorities, each with the responsibility for the collection and recycling of municipal waste in their respective areas (ODPM 2004c; Read 1999).

The situation is different in London. All London boroughs including the Corporation of London have a statutory responsibility for the collection of municipal waste within their administrative boundaries. Approximately two-thirds of the boroughs have a two-tier system with split responsibilities for waste management. These boroughs are organised into four statutory cross-borough waste disposal authorities (Joint Waste Disposal Authorities - JWDA) with the responsibility for treatment and disposal of waste on behalf of their constitute boroughs (Defra 2006c; ODPM 2004c; Read 1999). The other one-third of London boroughs and the Corporation of London have a single-tier or unitary approach to waste management. Unitary authorities combine the powers and functions of non-metropolitan counties and districts with

core responsibilities for strategic planning, waste collection, treatment and disposal of municipal waste (Jones *et al.* 2004; ODPM 2004c). These operational arrangements are overlaid with waste planning and development control responsibilities in each London borough in their role as a WPA (Defra 2006c).

The division of responsibility between WDA and WCA in two-tier authority areas mirrors the separation of responsibility at the national level and present similar issues of coordination between policy and planning development, particularly where proposals need to be brought forward in the form of planning applications (Figure 2.1). There are difficulties gaining timely plan and strategy formation which highlight the need for more effective decision-making with appropriate representation from district, borough and metropolitan councils (Defra 2007a; Bulkeley *et al.* 2005). The unitary model that is gradually replacing the two-tier system allows for the integration of waste management across the whole lifecycle from collection and treatment to disposal of residual waste, which may improve coordination of operation and planning activities. However, waste planning is integral to delivering the large number of varied facilities stipulated in the waste review, specifically AD technologies. Thus, it becomes crucial to remove the structural inefficiencies inherent in the current system of split responsibilities for waste management. SITA (2010) suggests joining separate structures and responsibilities for waste collection and recycling and waste disposal, as well as combining strategic planning and spatial planning, to improve efficiency in terms of cost and efficacy of planning.

The *2010 Localism Bill* proposed by the coalition government in 2010 is set to create "a substantial and lasting shift in power away from central government and towards local people" (Hon Greg Clark in DCLG 2011; p.2). Included in the bill are plans to devolve new powers to local authorities and establish new rights for local people and communities as part of a 'Big Society' concept that will enable local people and their elected representatives to take a lead role in decision making (DCLG 2011). These changes ought to allow local government the freedom to interpret the information and advice from central government based on the needs of their local populations and infrastructure (House of Commons 2010).

A notable change is the removal of regional spatial strategies that directed local policies, favouring a more 'bottom-up approach' that focuses on community input and the capacity of localities to sustain growth (DCLG 2011). Currently, the influence of the regional authorities over issues of management is not clear, with policy flowing directly between central and local government with some communication with regional bodies (Bulkeley *et al.* 2005). Nevertheless Government's aim to drive localism; notably decentralised decision-making and abolished regional Government, will require comprehensive consultation with stakeholders across the waste sector to determine how to deal with the possible adverse effects of removing a body that sets the strategic framework for local planning.

The introduction of the Environmental Protection Act of 1990, which has promoted the separation of operational and regulatory functions in waste management, has shifted a significant share of responsibility to private companies or local authority owned, but arms length waste management operators. These companies are employed by a growing number of local authorities to carry out operational services such as waste collection and treatment or disposal of residual waste and are central to delivering changes in the way waste is managed. Private sector companies are now viewed as vital partners in shaping the nature and extent of waste management policy. However, the emphasis on localism suggests private companies need to devise more effective ways to collaborate with communities in identifying local needs and selecting technology.

The role and functions of local authorities and their partners - in terms of collecting, disposing and recovering waste - are now carried out in a more prescriptive legislative and regulatory context of statutory targets, indicators, penalties and rewards intended to shape the practice of each authority such that the composite national picture improves (Bulkeley *et al.* 2004; ODPM 2005b). There is a good deal of common ground between Government's aims (e.g. meeting targets and managing waste in a more sustainable, integrated manner) and industry's need to meet its customers' and business expectations. However, the dynamics of the LATS is creating financial risks and instability for local authorities and their partners (Defra 2007a).

A range of other government institutions and non-governmental organisations have a pivotal role to play in structuring national and local policy for waste management and providing guidance on public involvement. For instance, the Waste and Resources Action Programme (WRAP) works with local authorities to improve the operation of recycling schemes and leads on national waste minimisation programmes by co-ordinating awareness campaigns on waste. The Environment Council facilitates discussions on waste management at both the national and local level by providing advice on better engagement in decision-making processes (see Environment Council 2007a and b).

The waste management industry comprises all businesses (including voluntary and non-profit organisations) that are directly and indirectly involved in the collection, management, recovery and disposal of waste. Voluntary organisations have a number of roles including lobbying and campaigning on different waste issues to influence local provision for waste management. Some voluntary organisations coordinate and implement re-use and recycling schemes, sometimes in partnership with local authorities or through charity shops. Householders and communities have a significant role in ensuring waste management works effectively as they are the producers of waste and also service users of waste collection systems. The public plays a vital role in the implementation of new waste facilities, through participation in planning activities and can object to certain technologies, sites or proposals which can impede the development of new infrastructure (ODPM 2005b).

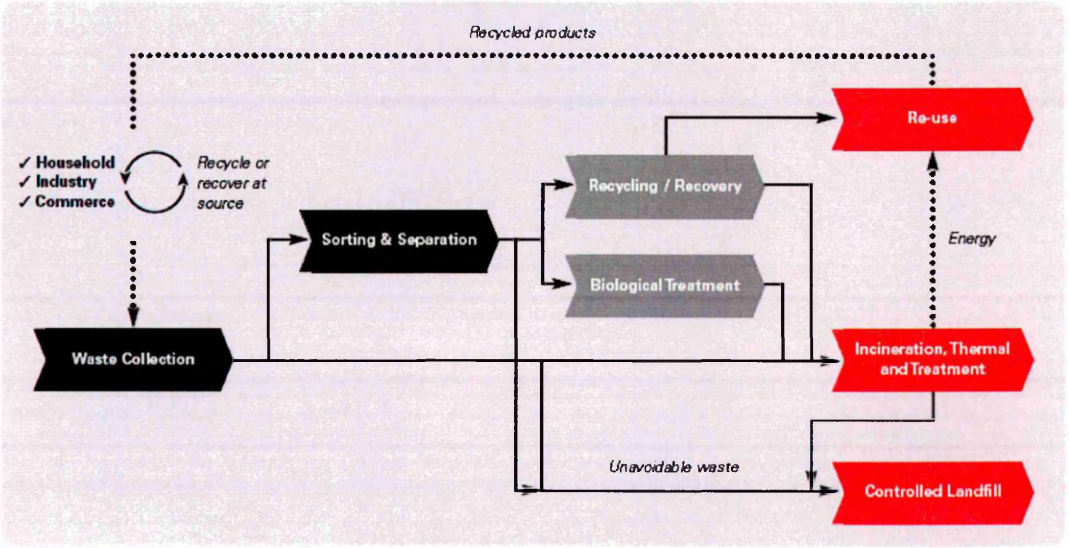
The successful planning and delivery of waste management infrastructure requires the waste management industry and the public sector to work closely together to produce a range of facilities that serve current and future needs, including those of local communities (Defra 2007a). Local authorities and waste managers have the responsibility to ensure the public: (1) fully recognises their involvement in waste management at every step of the process, (2) are encouraged to take ownership of their waste, and (3) appreciate more fully the concept of producer responsibility and are encouraged to take ownership of waste management facilities (Defra 2007a). This generally requires local authorities to adopt better approaches to communicate with the public and engage them more actively in solutions proposed.

2.4: Waste management options

A major challenge for local authorities is how to move from the traditional 'end-of-pipe' concept of waste management to more holistic resource management, which forms part of the wider global strategy to reduce carbon emissions and tackle climate change. The implementation of alternative municipal waste management options to reduce waste disposal to landfill and risks to human health and the environment presents a major technical, regulatory and socioeconomic challenge for the UK. A renovation of waste management infrastructure is needed along with swift planning, development and public acceptance of alternative technologies to meet strict requirements to divert biodegradable waste from landfill and to recover recyclables from the waste stream.

To meet long and short-term statutory targets, many local authorities are moving towards integrated waste management strategies which involve a combination of technologies to maximise the recovery of resources from the waste stream. Figure 2.2 shows a flow diagram for a typical integrated municipal waste management strategy.

Figure 2.2: A typical integrated waste management strategy



Source: Oracle 2004; p. 4

There is much debate on what mix of waste management options will meet landfill diversion targets to reduce carbon emissions and tackle climate change, while at the

same time provide added benefit in protecting the local environment and human health (e.g. Slater *et al.* 2007; WRAP 2006; Bulkeley *et al.* 2005). In practice, local authorities seek solutions that effectively deal with the local waste characteristics and at the same time offer flexibility to cope with changing regulatory and market environments.

2.4.1: Waste prevention and reduction

Government's aim to drive waste management 'up the hierarchy' establishes a priority for waste prevention and reuse, which is situated at the top end of the hierarchy of options. Inherent in England's waste review is a renewed agenda for sustainable consumption and production, with the objective to minimise waste production and maximise the return of waste that is unavoidable back into the production economy (Defra 2010b; SITA 2010). This is given credence by the new UK Sustainable Development Strategy and the upcoming European thematic strategies on waste prevention, recycling and natural resources, along with new European Directives such as the Energy Using Products Directives that are moving towards implementation.

The current EU Thematic Strategy on Prevention and Recycling of waste sets out the objective to prevent waste and promote reduction through reuse, recycling and recovery so as to decrease the negative environmental impact of waste. This promoted the idea that waste management policy (at the national level) should include both targets for waste prevention, re-use and recycling to re-introduce higher levels of waste back into the economic cycle and encourage safe disposal of minimum waste quantities (COM 2005). The current waste review reinforces these objectives suggesting the greatest environmental gains are to be made by preventing waste in the first place.

Recycling is almost universally prioritised in local authority plans to transform waste management, reflecting its position at the top of the waste hierarchy. However, the responsibility and systems for waste prevention is often debated. For example, the Producer Responsibility obligation that places a legal and binding responsibility for reducing waste with businesses (mainly through the Packaging Waste Regulations 2005) acts as a disincentive for local authorities to actively promote waste prevention

and reuse as the legal obligation is primarily with businesses (Defra 2006b). According to Defra (2005e) implementing prevention and reuse initiatives may involve initial capital outlays as well as ongoing revenue costs. For this reason, Waste Watch (2010) suggested future responsibility for waste prevention should be with producers that are better placed to prevent waste across the lifecycle of products and services, and are better equipped to ensure any unavoidable wastes are recyclable and reusable. Nevertheless, local authorities should be aware that the avoided costs associated with prevention and reuse will change over time (owing to rising disposal or treatment costs), especially where schemes are likely to prevent/reuse increasing quantities of waste over time (Defra 2005e).

UK legislation such as the Household Waste Recycling Act (2003) may have some positive impacts on recycling initiatives in England but this alone will not have the desired impact in terms of meeting targets. As such Friends of the Earth (2008) criticism that the National Waste Strategy 2007 failed to set waste prevention targets and stipulated un-ambitious recycling targets, may be deemed appropriate, bearing in mind 80% of household waste is recyclable or compostable (Defra 2007b). In contrast, some local authorities' have been sceptical of achieving the recycling targets set by Government on the basis that it is not cost-effective and can be resource intensive (e.g. RBKC 2006).

Defra's (2005f) guide to developing municipal waste strategies suggest few local authorities give serious thought to the operational detail of future recycling and composting collections. Defra (2005f) also suggests that the availability of local markets for materials collected, and the products derived from them is a key factor in determining what potential volume of the waste stream is recycled or composted. In terms of recovering inert material from the waste stream, some of the most efficient communities in Europe (e.g. the Netherlands, Germany and Austria) recycle on average 50% of their municipal waste thus leaving another 50% for disposal or treatment by some other technology (Defra 2006a; EEA 2002).

2.4.2: Waste treatment, recovery and disposal

The Government's target to reduce waste to landfill is driving a number of options (or technologies) for dealing with residual waste (defined here as waste left after

reuse and recycling/composting). Selecting the most appropriate waste management option at the local level becomes more difficult as the complexity of alternatives and issues associated with public acceptance, increase. The precise number and nature of waste management facilities will depend on the decision on the type of technology and scale of management. The implementation of local waste strategies will depend on public support and involvement, not only to meet statutory recycling targets but also to provide for the required waste treatment and disposal facilities in the timescales dictated.

A summary description of common waste management technologies is provided in Table 2.3, followed by a discussion around the practicality, and public perceptions of these technologies.

Table 2.3: Municipal waste management technologies: summary description

Technologies		Description of the treatment process
Non-thermal	Anaerobic digestion (AD)	This is a biological treatment process that decomposes green waste such as garden or kitchen waste in the absence of oxygen to produce a gaseous fuel which can be converted to energy.
	Composting	This is a biological treatment process that decomposes green waste such as garden or kitchen waste, normally in the presence of oxygen to produce compost.
	Mechanical biological treatment (MBT).	This process combines a waste sorting facility where waste is recycled with a biological treatment process where waste is composted. MBTs also process waste to produce a solid fuel (refused derived fuel) which can later be converted to electric energy and heat.
Thermal (including advanced treatment processes)	Incineration	Municipal waste incinerators combust unprepared (raw or residual) waste materials at high temperatures to produce steam which can be converted to electric energy and heat.
	Gasification	This advanced thermal treatment process converts pre-treated waste materials into a gaseous fuel which can be used to produce energy.
	Pyrolysis	This advanced thermal treatment process converts green waste, such as garden or kitchen waste in the absence of oxygen, into a gaseous fuel which can be used to produce energy.
	Plasma arc	This advanced thermal treatment uses electrical energy and high temperature to convert waste to a gaseous fuel which can be used to produce energy.
	Autoclaving	The waste autoclave is a form of thermal treatment that uses heat, steam and pressure to convert municipal waste into a solid fuel (refuse derived fuel) which can later be used to produce electric energy and heat.
Other	Landfill	Municipal waste landfill is a site for the disposal of waste materials by burial. The organic component of the waste is decomposed to produce a gaseous fuel which can be converted to energy.

Source: Defra 2007b; C-Tech Innovations 2003; POST 2000

Non-thermal treatment technology such as anaerobic digestion (AD) is emerging as 'acceptable technology' to deal with residual waste (WRAP 2009; Frick *et al.* 1999).

AD is mature technology with operating commercial plants in existence, though with limited experience in the UK (Defra 2010a; AEA 2009). Defra (2010a) suggests "it is vital the potential of AD technologies is recognised at all scales, from relatively small systems based in rural locations through to centralised plants that accept a range of different wastes that are transported to them" (p.3). However, the waste industry in the UK has experienced difficulties in determining the right mix of waste input, which is key to the efficient working of AD facilities (RTPI 2010). This suggests much more research and development is needed to establish the operational viability of these technologies.

The most significant disadvantage of AD is that it is only effective for treating the biodegradable portion of the waste, with some dependency on food waste to realise its gas generation potential (AEA 2009). The main factors that affect the economic viability of AD are feedstock, biogas yield and efficiency of utilisation. However, there is a potential to operate it alongside gasification to combine the gases produced from both processes to burn in a single gas turbine, thus achieving considerable cost savings (Griffiths and Williams 2007; C-Tech Innovations 2003). Defra (2010a) suggests the focus ought to be put on establishing markets for input feedstock and digestate to facilitate commercialisation of the technology and access to finance. However, getting these facilities through planning will require careful consideration of the location of the plant and transportation of wastes. AEA (2009) suggests that while AD's public image is not as divisive as combustion technology (i.e. EFW incineration), the potential for odour problems and the transport of slurries in rural areas is problematic and often the focus of public opposition to AD facilities, as is the large scale transport of food waste.

Composting is recognised as a major competitor to AD. While it does not have the capacity to produce energy as does AD, it is a lower cost alternative and popular with waste managers due to its status as a recovery, rather than disposal process (AEA 2009). The overall picture for composting in the UK is one of continued expansion reflected in the growth of centralised facilities over the last few decades (WRAP 2009; Frick *et al.* 1999). This growth in capacity is likely to expand with increasing collections of source segregated food wastes (WRAP 2009), and in the past has been matched by an ability to find markets for compost (Slater and

Frederickson 2001). However, there are questions about whether this rapid growth is sustainable with more emphasis placed on the quality of the compost produced (WRAP 2009). The fact that legislation may change the situation over time (e.g. compost standards) suggests that waste management operators should strive to deliver high quality of materials from their collection and processing systems.

The use of mechanical biological treatment[6] (MBT) facilities has risen among local authorities in recent years and is considered a more acceptable technology (compared to EFW incineration) for achieving landfill diversion targets (Coggins 2004). Around 17 local authorities are thought to be planning the development, in the process of developing, or have one or more MBT facilities (Juniper 2005; Coggins 2004). MBT can enhance recycling performance, even with the use of sophisticated kerbside recycling schemes. However, there are a number of obstacles and uncertainties which are currently restricting the use of MBT as a viable alternative to landfill.

According to Chartered Institution of Water and Environmental Management (CIWEM 2006), there are uncertainties regarding the strength of markets for MBT end products such as refuse derived fuel (RDF)[7] and biologically stabilised products for application to land (AEA 2009). Additionally, the output of an MBT process will be classified as biodegradable waste under the 1999 Landfill Directive, thus requiring additional processes such as composting to take place or alternatively be subject to the full landfill tax if disposed. CIWEM suggests there may not be any net environmental benefit in adding further energy consuming processes to a recovery/disposal route. There are additional concerns about the suitability of some of the residues from MBT plants for landfilling. Nevertheless there is generally less public opposition to MBT plants, so it is quicker to achieve planning permission for these facilities compared to EFW plants.

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[6] Mechanical biological treatment integrates a number of waste treatment processes including material recycling facilities, refuse derived fuel, sorting and composting plants (Coggins 2004).

[7] Refuse derived fuel (RDF) involves the removal of inert and green waste from the municipal (or household) waste stream, followed by pulverisation to produce a feedstock which can be incinerated in power stations, pyrolysis or gasification systems or co-incinerated in other industrial combustion processes (e.g. as part of an EFW system) (ESA 2006; POST 2000).

Thermal treatment technologies

Thermal treatment of waste in the UK has traditionally involved some form of energy recovery. Energy from waste (EFW) incineration is the most common and well established technology used to recovery energy (Defra 2007b). Nevertheless, there is a dichotomy of views on the role of EFW incinerator facilities as part of an integrated municipal waste strategy. Depending on individual positions, EFW incineration can be seen as a practical, pragmatic and cost-effective solution to reduce landfill; or a short-sighted, short-term strategy with the potential to inhibit future improvements in recycling and composting (SLR Consulting 2005; ESA 2004). The growing interest in EFW incineration as a feasible alternative to landfill is further dampened by perceptions of risks (and NIMBYist attitudes) that prevent wide based implementation of the technology.

EFW incineration generally has had a very poor image in the UK and has not taken off largely because perceived risks make it deeply unpopular among local communities (SLR Consulting 2005). An earlier version of the National Waste Strategy 2000 led to the suggestion that the number of waste incinerators in the UK would have to increase substantially to meet landfill diversion targets. Estimates from industry suggest that 130 (Davoudi and Evans 2003) to 165 (POST 2000) new municipal waste incinerator facilities would be required to deal with residual waste. But EFW incineration has met with considerable opposition from the media and public and so the revised policy said EFW incineration would have to be part of an integrated waste management strategy, where opportunities for recycling and composting would have to be explored first. However, concerns remain that there is no definitive guidance on how local authorities can prove that options higher in the hierarchy have been exhausted before adopting EFW incineration (POST 2000).

Nevertheless EFW incineration continues to play a limited role in local waste management policy. The UK Without Incineration Network (UKWIN) lists about 29 existing EFW incinerators (4 of which are under construction) and 81 potential facilities across the UK (UKWIN 2009). The limited number of existing facilities is largely associated with issues of public acceptance and political will, where large numbers of waste facilities have been successfully 'fought off' by local communities (FOE 2005). For example, the Government refused plans for the extension to one

incinerator (Edmonton, London) on the basis that it would act as a disincentive for recycling (Greenpeace 2002). In response to such public pressure, many local authorities are reluctant to commit to EFW incineration and seek more acceptable technologies which retain operational flexibility over long term contracts, do not prejudice direct recycling and represent realistic value (Biffa 2006).

The more advanced thermal treatment technologies (ATT) that primarily employ gasification and pyrolysis to process municipal waste are considered "new and emerging technologies – tested, pilot-scale plants with commercial solution in development" (C-Tech Innovation 2003; p.10). These technologies may offer the possibility of enhanced material and energy recovery and reduced landfill. According to C-Tech Innovations (2003) gasification and pyrolysis have the advantage over EFW incineration because they offer the opportunity for high efficiency electricity generation. However, it is not as cost-effective as EFW incineration as plant equipment is expensive and requires regular maintenance to maintain high efficiency. In addition, they are relatively unproven on a commercial scale for municipal waste in the UK and if adopted, may be perceived as 'incineration by another name' by the public, thus creating opposition to facilities during planning (C-Tech Innovations 2003). Conversely, the potential for smaller scale implementation (compared to EFW incineration) could improve public perception and increase the likelihood of gaining planning permission over larger facilities.

2.4.3: Integration of waste management technologies

Efforts to deliver an increase in energy from waste through AD (Defra 2010a and 2007b) has resulted in increased collections of source segregated food waste and the integration of large and small scale AD processes to recover energy from wastes. The challenge however, is the integration of waste management technologies to treat residual waste or recover energy from wastes (Tunesi 2010). The issues are the selection of technology, the need for pre-treatment or off-site energy recovery, and the scale of plant for thermal treatment of wastes (Tunesi 2010; Defra 2007b). Tunesi (2010) suggests that Government's reluctance to set specific targets for energy recovery from waste through thermal treatment has left waste management

operators indecisive about the nature and location of much need thermal treatment facilities.

The heterogeneous nature of municipal waste is most suitable for established EFW incineration technology which can usually treat residual waste directly after source separation of food waste and extraction of dry recyclables (AEA 2009). However, the large scale at which they perform best economically means they are sized for maximum waste flows, which creates some inflexibility in a waste management system (Tunesi 2010; SLR Consulting 2005; C-Tech Innovations 2003). Conversely, most ATT processes (e.g. gasification and pyrolysis) require the pre-treatment of residual waste so will often be complementary to pre-processing facilities such as MBT, thus optimising potential for energy recovery and integration into wider municipal waste management strategies (Tunesi 2010; Defra 2007b).

A major issue that has had impact on planning is the scale and size of waste facilities proposed. Large facilities (situated at a regional or national level) have benefits such as economy of scale, contributing to waste reduction and overall compliance with government targets. However, large installations take much longer to deliver, depending on the type of technology: energy from waste (large – 10 years; small – 7 years), advanced thermal (e.g. gasification – 7/8 years), mechanical biological treatment (large – 6 years; small – 3 years) and composting (2/4 years), clean material recycling facility (4 years), household waste recycling centres (3 years) (Defra New Technology Programme 2005; ESA 2004). Technologies such as EFW are taking longer to deliver mainly because of poor public support for large-scale facilities (e.g. 400,000 tonnes per annum).

Generally large-scale facilities, particularly EFW incinerators, release larger amounts of emissions compared to small-scale facilities, and inevitably lead to more traffic, and consequently more greenhouse gases being released to the atmosphere. ATT technologies (e.g. gasification and pyrolysis) can be built economically at a smaller scale and are seen as greener and cleaner technology to replace dependence on large-scale EFW technologies (AEA 2009; Defra New Technology Programme 2005). These small scale plants can be cost-effective, sited locally or close to the waste source (thus minimising transportation), and in some cases can provide heat and hot

water to industry as well as electricity to the residential and/or industrial sector (AEA 2009; Defra New Technology Programme 2005; ESA 2004; C-Tech Innovation 2003).

Most local authorities are considering 'new and emerging technologies' such as gasification and anaerobic digestion as an alternative to landfill because they appear to be less controversial in terms of public acceptance. The Government's New Technology Demonstrator Programme[8] is developing a range of pilot schemes to demonstrate the strengths and weaknesses of operating ATT processes. The programme has identified commercial possibilities for new growth in the waste management industry but concerns regarding the short track record of these technologies and potential operational risks prevent wide implementation. For this new sector to grow, political stimulation and public confidence will need to be developed alongside continuing research and development in the technology (Griffiths and Williams 2007).

Tunesi (2010) suggests an unbalanced reliance on pre-treatment (e.g. MBT) and ATT technologies (e.g. gasification or pyrolysis) not yet established at a commercial level may prove detrimental for waste management operators in their ability to achieve landfill diversion targets (p.50). The successful integration of EFW incinerators with material recovery and composting technologies will depend on appropriate planning and design considerations, along with fluctuations in secondary markets for recyclables and quality standards for composts. For instance, siting should consider distance from waste source, transfer, and disposal, as well as energy use. The sizing of EFW incinerators should consider the impact on material and energy recovery (Tunesi 2010; AEA 2009).

In the expected climate of increased local choice created by the Localism Bill, RTPI (2010) suggests the successful integration of EFW through thermal treatment and AD will require efforts to support local decision-makers needs, either in framing

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[8]The New Technology Demonstrator Programme is a part of Defra's Waste Implementation Programme in response to strategic measures recommended by the Strategy Unit *Waste Not, Want Not* report published in 2002.

suitably pro-EFW policies in their plan documents, or in taking site-specific decision.

2.5: Risk, uncertainty and ambiguity around waste management options

Local authorities face the complex issue of dealing with uncertainty in developing waste strategies, particularly those that adopt alternative waste management options to landfill (e.g. MBT, EFW incineration). Uncertainty is endemic from the fundamental understanding of current and future waste arisings to the ability to assess potential environmental and health impacts of single or multiple facilities (Petts 2004). There are important distinctions made between the level of uncertainty, largely associated with the nature and type of waste management technology. These are categorised as risk, uncertainty and ambiguity in the risk assessment and the decision theory literature (e.g. Stirling 2003; Jaeger *et al.* 2001).

Risks, which may be perceived as catastrophic, are created by technology rather than a 'natural' occurrence and may not be counterbalanced by any perceived benefit (Petts 1994). Generally there is little uncertainty associated with environmental impact or the potential threat to human life as probabilities and consequences are known to science - in most cases, these are restrictive and do not include social consequences. For instance, the risk associated with hazardous waste facilities is based upon models that characterise pollutant pathways in an open environmental system and model the release of the source of hazard to the environment (Pollard *et al.* 2006). Such risk assessments are deterministic in approach - i.e. based on an attempt to measure the level of exposure at receptor (community) and the use of this data to predict a direct or indirect environmental or health impact.

The Environment Agency has applied risk assessment to the landfill and hazardous waste sectors (e.g. Environment Agency 2001). However, there has been considerable controversy applying and communicating the results of risk assessments of, for example, the potential health risks to communities near municipal incinerators or other hazardous waste facilities. These are related to the heightened awareness and discussion around the potential risks to human health from waste management activities, the aggregation of risks from multiple technologies,

and the debates around the complex methodological issues involved in comparing risks to different groups and addressing disparity in value perceptions (Petts 2004; 2000; Dolk 2002; Eduljee 2000).

The level of ***uncertainty*** or lack of knowledge around environmental impacts in relation to the nature and extent of technological and social hazards, and the value placed on social consequences is particularly important in today's post-modern society (Wynne 1994). Risk assessments that only model exposure to emissions will have little support from communities that are largely concerned with the social and political assumptions that underlie expert models and assessments of actual exposure and effects (Petts 2004; Stern and Fineberg 1996). In addition, operators and regulators are increasingly challenged over the communication of risks to multiple groups and their relative importance. Such risk assessments may contribute to information being viewed as inadequate and other options for assessment eliminated on the basis of 'high risk' (e.g. new and emerging technologies such as gasification and pyrolysis that are considered unproven on a commercial scale and thus of high risk).

Ambiguity exist where there is either limited knowledge or conflicting information (or expertise) on the level of exposure and potential for environmental or health impacts. It also exists where there is controversy about how to quantify or compare social consequences (based on several distinct perspectives on the issue and the value of consequences). For instance, the health risk of incinerator facilities is a common cause of concern among communities, compounded by the lack of expert literature on the relative environmental and health risks of different waste management technologies (Petts 2004). This could be the reason why significant attention was placed on the EUROHAZCON study (Dolk *et al.* 1998), which investigated the incidence of congenital abnormalities (birth defects) around 21 landfill sites in Europe (most of which were in the UK)[9]. The findings from the study were a source of debate and to date fuels controversy over the definition and

[9] The EUROHAZCON study found that mothers living within 7 kilometres of landfill site had a higher incidence of non-chromosomal congenital abnormalities than those women who lived further away. The authors of the report concluded that further investigation was needed between landfill sites and congenital abnormalities to eliminate casual relationships.

management of the health hazards associated with waste management facilities, namely the exposure to emissions from incinerators and the environmental impacts of landfill. Environmental lobby groups and citizens actively seek to incorporate such information and knowledge in decisions on waste policy and the choice of technology.

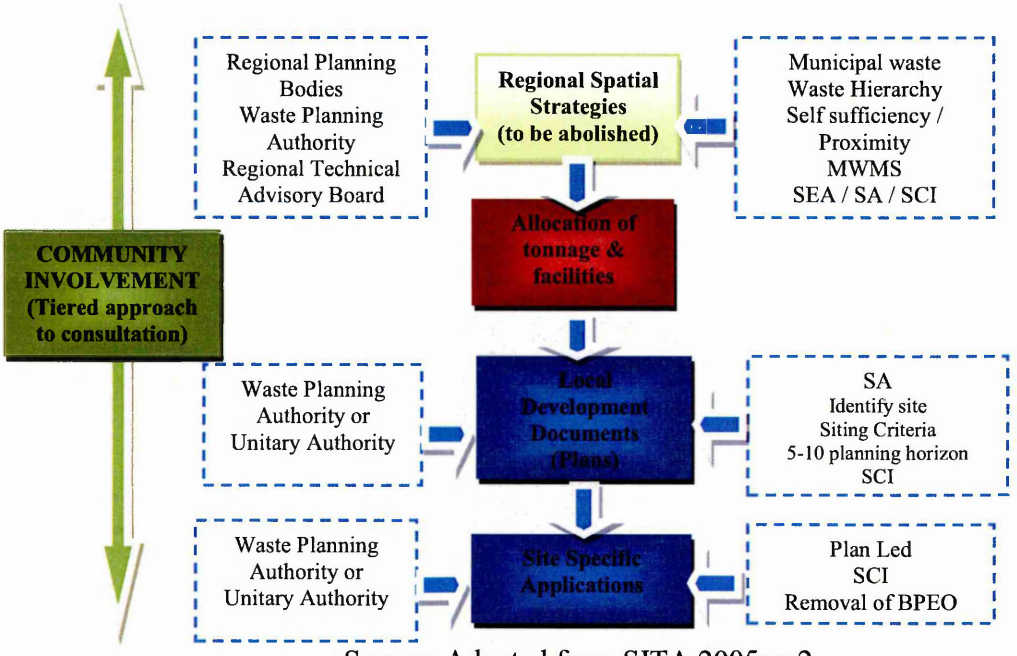
Most scientific tools used to assess waste management options (e.g. risk assessment, life cycle assessment, strategic environmental assessment, cost-benefit analysis) incorporate uncertainty into the analysis. However, most are restricted to modelling quantifiable risk, largely excluding discussions of ambiguity which is mainly associated with valuing social consequences. For example, life cycle assessment is considered limited in terms of only evaluating the substantive elements that can be quantified and not being able to deal with localised impacts that become a public priority, such as health risks from municipal incinerators (Petts 2000). Other unanticipated or uncertain consequences that are not known to science or considered by scientists (e.g. cumulative impacts associated with emissions from existing and proposed facilities) may be viewed as inadequate in risk models, largely because of the level of uncertainty inherent in the information.

A study by Powell (2000) revealed specific problems related to a lack of understanding of the difference between local and global emissions and a lack of local environmental knowledge, which limits understanding of the significance of emissions. There is some potential to incorporate discussions of uncertainty within a strategic environmental assessment as it is embedded in a legislative system (Section 2.7) which suggests some desirability for consultation and stakeholder involvement in fundamental activities that include the identification, prediction, interpretation and communication of risks throughout the strategic planning process (Defra 2005h). Nevertheless, the potential to capture wider political and social issues may be further enhanced by combining the tool with a thorough evaluation of social and economic factors.

2.6: Waste strategy development and facility planning process: approach to decision-making

The process for developing, implementing and reviewing local waste management strategies and plans is a continuous one which requires the procedures for strategic decision-making, monitoring and review to be designed and aligned to facilitate effective delivery. Figure 2.3 illustrates the framework for which municipal waste management strategies and development plans are established and identifies key actors and tools for decision-making. This also sets the scene for discussion in subsequent sub-sections.

Figure 2.3: Local waste strategy and facility planning process



Source: Adapted from SITA 2005; p.2

The principles for sustainable waste management (i.e. waste hierarchy, self sufficiency and proximity) are incorporated as specific objectives to be delivered through municipal waste management strategies (MWMS) and local development documents (LDD).

The appraisal of options and sites for municipal waste is undertaken during the preparation of the strategy and development plan to aid the implementation of sustainable development (see Section 2.1). A strategic environmental assessment (SEA) is required for the development of MWMSs under the EU Strategic

Development Directive and a sustainability appraisal (SA)[10] for LDDs, under the Planning and Compulsory Purchase Act 2004. SEA has more of an environmental focus (e.g. living within environmental limits) while SA includes greater coverage of the social and economic aspects of sustainable development (e.g. achieving a sustainable economy and promoting good governance).

SEA and SA are more rounded assessment tools that replaced the Best Practical Environmental Option (BPEO), a fundamental policy tool, promoted in Waste Strategy 2000, to develop waste management strategies. BPEO (which incorporates life cycle assessment) had evolved into a highly technical exercise, which required harm to the environment to be quantified (SITA 2004). The resulting complexity of numerical analysis prevented easy integration into local decision-making processes, where unquantifiable (or largely social) impacts such as employment, visual impact, and local amenity considerations, are not subject to a similar level of rigorous, scientific assessment and as such, are not given equal consideration in decision-making. Consequently, it is debateable whether BPEO analysis was seen as decisive in granting planning permission for a waste facility (Petts 2000; Powell 2000). Hence other policy tools to emerge (i.e. SEA and SA) have introduced requirements to go beyond the traditional consultation approach to adopt more deliberative and participatory approaches. RTPI (2010) suggests the problem is the emphasis local authorities place on principles of self sufficiency and proximity as part of their decision making, which may cause problems with developing new, centralised advanced waste treatment facilities that capitalise on economies of scale.

2.6.1: Statutory requirements for public involvement

The Labour Government undertook a programme of reform of local government to strengthen community involvement in local decision-making. According to the 1998 White Paper *Modern Local Government: in touch with the people*:

> "It is essential that there should be a clear and understandable strategy for every area, based on an analysis of the area's needs and priorities for future action. It should be developed with local people, local business and with

[10] SA is not required at the planning application stage but the conclusions of the SA can be built into policies for determining planning applications (ODPMb 2005).

public and voluntary sector bodies who operate in the local area" (DETR 1998a; p.64).

The Local Government Act 2000 put further emphasis on engaging local people in meaningful consultation. The Act placed a responsibility on local authorities to develop a community strategy for engaging local residents in the delivery of council services (including waste) and set a framework for people to play a bigger role in shaping their local communities (ODPM 2004a; 2004b). In line with the 'Modernising Local Government' agenda, local authorities are now required to 'actively' involve the community and other stakeholders from the early stages and throughout the entire process of developing municipal waste management strategies (MWMSs) and local development documents (LDDs) including facility proposals. This was stimulated by the Aarhus Convention (UNECE 1998) which established a principle of open communication between government and citizens, and sought to engage greater involvement at all stages of environmental decision-making.

The 2003 EU Directive providing for public involvement in the development of plans and programmes[11] implements this objective and seeks meaningful and continuous engagement on issues such as developing (or revising) the MWMS and LDD. Mechanisms such as strategic environmental assessments (SEA)[12], statements of community involvement (SCI)[13] and sustainability appraisals (SA) require local authorities to pursue more and better forms of engagement and are structuring the way that people are involved in decision-making. SCIs are specifically required in the development and revision of LDDs and in the consideration of site specific planning proposals. The SCI sets out how "active, meaningful and continued involvement" of local communities and stakeholders will be maintained throughout the process (ODPM 2004b; p.6).

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[11] Directive 2003/35/EC is being implemented in part through amendment of the Environmental Impact Assessment (EIA) Directive, the Integrated Pollution Prevention and Control (IPPC) Directive and principles already embedded in the Strategic Environmental Assessment (SEA) Directive.

[12] The EU Directive 2001/42/EC (the SEA Directive) transposed to England by the Environmental Assessment of Plans and Programmes Regulations 2004 ('the SEA Regulations) promotes innovative and active involvement of stakeholders from the early stages of the MWMS development and throughout its development thereafter.

[13] The Planning and Compulsory Purchase Act 2004 introduced the requirement for each local planning authority to produce a SCI that set out how communities will be engaged in the preparation of LDD and consideration of planning applications.

SEA is required in the development and revision of MWMS and is intended to be a systematic and transparent process, fundamental to decision-making (ODPM 2005c). It addresses the environmental effects of the waste strategy, applies the aims and principles of environmental impact assessment and is a flexible and diversified process. As well as being fundamental to the preparation and revision of deliverable MWMSs and facility applications, the SEA and SA processes are distinct requirements for the development of waste management strategies and development plans (Section 2.4) but government guidance (ODPM 2005c) suggests they be applied as a single integrated approach to evaluate waste management options. Hence if the SA is carried out following the guidelines for the SEA, then there is no need to carry out a separate appraisal procedure. The approach taken could be a single project to ensure the appraisals for both the MWMS and LDD (including facility proposals) are consistent and duplication of work is avoided.
The Government's Policy Guidance (Defra 2005c) suggests that both communities and stakeholders should be involved in the development of waste strategies to maximise the benefits of standard consultation and also fulfil the requirements of SEA.

> "Authorities should also engage the local community and other external partners innovatively and actively at an 'early stage'. Appropriate consultation should be continued throughout the strategy development process. Where authorities are considering the procurement of a waste management contract it is vital that potential private sector partners are engaged at an appropriate stage to ensure the final proposals are deliverable" (Defra 2005c; p.9).

The principles underlying early public involvement are (Defra 2005g; p.2):

- **front loading** – there should be opportunities for early community involvement, before key decisions are made
- **accessibility** – methods should be transparent, relevant to the experience of communities and fit for purpose; and
- **continuity** – clearly articulating opportunities for continuing involvement – community engagement is not to be taken as a one-off event

Under the 2010 *Localism Bill*, the coalition Government envisaged that local communities will play an even greater role in decision-making; deciding what waste management facilities are adopted and what benefits the host community is likely to accrue (House of Commons 2010). The Bill gives local people the right to vote (via referendums) on any waste issue they think is important and local authorities and other public bodies will have to consider the outcome in their decision-making. However, there are concerns that local referendums on planning applications may delay decisions on vital infrastructure (e.g. ESA 2011). Hence, the proposal that local plans for waste facilities be developed through collaboration with local communities will require a planning system that correctly distinguishes between local and national issues, and ensures local representatives are fully equipped to take decisions, rather than passing them on to central government. The building momentum for deliberative engagement implies much emphasis will be put on experiences and expertise of deliberative processes. The role of private sector is a crucial part of implementing the necessary mechanisms for effective community engagement. In part these mechanisms will be informed by international experiences of deliberative decision processes, but also traditions and practices that have more local roots (see Section 3.5).

The requirement for public involvement necessitates clarification about who represents 'communities' and 'stakeholders'. Defra (2005g) suggests that within any local authority area, the community comprises many different groups, not all of which are established and represented by formal community groups. Community groups may focus on place or on interests, principles, issues, values or religion. In cases where interests are not organised, members of the community may be less able to engage with formal consultation processes, but they are of no lesser interest or less valid than organised groups (e.g. resident associations, local businesses, and youth, religious and recreational groups). Effective community involvement is dependent upon a good understanding of the composition, needs and interests of all different groups within the community and their varying capacity to engage.

Stakeholders include communities, but also groups with a wider interest in waste management who may not have an involvement with the specific place or area for which the strategy or facility proposal is under consideration. Wider stakeholders

include both internal and external partners. Internal partners are officers and members within authorities that should be consulted on the strategy – these might include elected members, finance officers and planning officers. External partners may represent a particular interest group or bodies that must be consulted for the appraisal of the waste management option – these might include the waste management industry, the environment agency, national non-governmental organisations or environmental campaigners (who may have local branches representing interests within the local community) and other relevant public bodies outlined in Government's guidance (e.g. Defra 2005g).

The Environment Council (2007b) suggests there are two distinct stages of public involvement in waste management that distinguishes who is included at different stages in decision-making. One is the involvement of stakeholders and the general public on issues related to strategy and policy development, where there are no given 'parameters'. The other is the involvement of stakeholders and communities on a specific site or proposal, where there may be fixed parameters (perhaps set by policy or location) which are non-negotiable. Generally as public involvement moves from strategy to specific site applications, issues may become more contentious as people are usually more engaged in the process (Environment Council 2007a and b).

2.6.2: Public involvement in municipal waste strategy development

Government guidance, at various stages of the strategic environmental assessment (SEA), suggests it is desirable to consult with the public and other stakeholders to maximise the benefits of consultation on the municipal waste management strategy (MWMS). Stakeholders' views can be used to provide verification regarding the deliverability of proposed technologies, with the views of industry and the community sector, in particular being solicited. The SEA Practice Guide (ODPM 2005c) encourages local authorities to map the consultation required for the SEA against that intended for the MWMS as a whole to produce a joint consultation plan. The following summary (Table 2.1) identifies where consultation is required and desirable throughout the SEA process in preparing or revising MWMS.

Table 2.4: Government's guidance on consultation for MWMSs

Plan or programme	Decision-making structure	Stages of the process	Outputs	Requirements for public involvement	
				Statutory minimum	Desirable
Municipal waste management strategy	Strategic environmental assessment	Before SEA	Baseline report		Local communities, external partners
			Scoping report	Statutory consultation bodies	Local communities, external partners
			Menu of options		Local communities, external partners
		During Option Appraisal	Option evaluation		Local communities, external partners
			SEA Environmental report	Statutory consultation bodies	
		After Option Appraisal	Draft strategy		Local communities, stakeholders
			Final strategy	Environment Agency, Secretary of State, The Mayor of London (in London) and the public	

Source: ODPM 2005c, p.17; Defra 2005c, p.24

Three stages of consultation are required in the preparation/revision of MWMSs (i.e. before SEA, during option appraisal and after option appraisal). The requirements are outlined in the SEA guidance and Code of Practice on Consultation[14] and summarised below (Defra 2005h; p. 3-6):

- ***Before SEA*** – the first stage of consultation with statutory consultees is the preparation of a scoping report. An SEA is required where the MWMS is likely to cause significant environmental effects to an identified area at the local level. Paragraph 9(2) (b) of the SEA Regulations requires that statutory consultees (in England: the Environment Agency, English Nature, English Heritage, and the Countryside Agency) be consulted as part of a screening process. This is to determine whether plans/programmes are likely to have a significant impact and whether they should be subject to an SEA.

[14] HM Government, Department for Business Enterprise and Regulatory Reform (2008): Code of Practice on Consultation

- ***During Option Appraisal*** – the same environmental bodies and the public must be consulted when determining the scope and level of detail of the information to be used in the report. It is desirable to consult with the public and other stakeholders at this stage of the SEA. Consultation on the SEA scoping report could be carried out jointly with that on the strategy baseline report and government recommends this takes a minimum of 5 weeks

- ***After Option Appraisal*** – the environmental bodies and the public must be consulted on the draft MWMS and Environmental Report when it is produced. However, if the strategy is developed in several phases (e.g. early proposals with various options followed by subsequent proposals with a preferred option) then more than one round of consultation may be required. The views expressed during the consultation period must be taken into account during the preparation of the strategy and before its adoption. When adopted, the environmental bodies and the public must be informed and authorities must outline how the views expressed during consultation has been taken into account. This account must be made available along with reasons for deciding upon the strategy proposals, in light of other reasonable alternatives. The Code of Practice on Consultation states that authorities should allow at least 12 weeks for written consultation at least once during the development of policy.

The Government acknowledges it may be difficult to gain public interest in waste issues at the strategic level as it is largely characterised by technical discussions around complex issues but it is advocating a more fundamental, constructive engagement with communities and stakeholders. Guidance produced has identified the role for both traditional approaches (i.e. information and consultation) and non-traditional approaches (involving and partnering approaches) to public involvement (see Section 3.4) (Defra 2005g). In the past, the focus of public consultation strategies has been on disseminating information to raise awareness on environmental issues and encourage people to use services. However, government guidelines have shifted the focus to more innovative forms of public involvement such as community advisory committees (Section 3.5.2) to obtain 'mutual agreement' on new services and facilities.

2.6.3: Public involvement in facility planning

The strategy for community involvement (SCI) sets out local authority arrangements for involving communities and stakeholders in the preparation and revision of LDDs and for consultation on planning applications (or proposals). The requirements in the SCI necessitate clarification of the type of planning application that may require different levels of community involvement and stakeholder consultation. There has been a broad range of responses from local planning authorities regarding the appropriate benchmark for planning applications that may require 'wider community involvement' (ODPM 2004a). Many authorities have suggested that 'local considerations' are essentially part of the authority's policy for involving the community on planning applications. SCIs are not specific in terms of the type of community involvement expected for each application but a tiered approach to public involvement has been recommended. This relates to the use of indicative thresholds for determining which applications are to be subject to different types of community involvement. The approach provides a broad framework/benchmark within which individual authorities can define the extent of community involvement. Local authorities may consider adopting thresholds[15] to help determine which proposals require the highest level of community consultation, generally on the basis of the nature, scale and size of facilities.

- ***Tier 1*** – major planning applications classified as tier 1 may be expected to have the widest level of community involvement. This applies to applications listed under Schedule 1 developments which are those schemes that likely to have a significant effect on the environment (as defined by the EIA Regulations). According to Regulations 2(1), these include: (a) "the installations of waste disposal for the incineration, chemical treatment, or landfill of hazardous waste with a capacity exceeding 100 tonnes per day" and, (b) "quarries and open cast mining where the surface of the site exceeds

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[15] Development Plan Departures [ref: Circular 07/99, Town and Country Planning (Development Plans and Consultation) (Departures) Directions 1999]
Communities and Local Government (DCLG): The Town and Country Planning (Environmental Impact Assessment) (England) (Amendment) Regulations 2007.
The Environmental Impact Assessment (EIA) Directive 85/337/EEC as amended by 97/11/EC and by Article 3 of Directive 2003/35/EC
ODPM (2004a; p.33 – 39). Statement of Community Involvement and Planning Applications

25 hectares". The latter is particularly relevant for landfill developments. In these circumstances, the local authority may consider the use of the widest range of techniques ranging from traditional consultation methods (e.g. public meetings, development briefs, the media etc.) to more innovative methods (e.g. enquiry by design, citizen or community panels etc.).

- ***Tier 2*** - major planning applications classified as tier 2 may be expected to have a wide level of community involvement. Local authorities are expected to undertake *"a greater level of community involvement above that normally carried out (e.g. posting of site notices or neighbourhood notification letter)"* (ODPM 2004a; p.33). This applies to applications under Schedule 2 developments which are those that are likely to have an effect on the environment by virtue of factors such as their nature, size and location (as defined by the EIA Regulations). Applications that fall within this category are those that may have transport implications and will require a full Transport Assessment (e.g. large scale or central waste disposal/treatment facility). Development proposed on playing fields as set out in the Town and Country Planning (Playing Fields) (England) Direction 1998. The Direction applies to any proposal for development of any 'playing field' owned by a local authority or used by an educational institution. This includes, for example, parkland, open space used for informal recreation, or land leased to sports clubs, as well as playing fields used by schools, colleges and other educational institutions. In these circumstances, authorities may consider engaging the public through public exhibitions or enquiry by design exercises that involve key stakeholders in a series of planning workshops.

- ***Tier 3*** - major planning applications classified as tier 3 are likely to be determined on a 'site-by-site' basis at the local level. Applications of a local significance (as defined by the EIA Regulations) such as those which fall marginally below the thresholds identified under tier 1 and 2 would require wider community involvement, where the scale and type of involvement should be determined by the local planning authority. Applications that fall within this category are those that are 'sensitive' to development pressures - development adjoining a listed building; substantial demolition of in a

> Conservation Area; loss of allotment land; loss of employment land for housing; and development of windfall sites. It also included allocated sites that may not have been subject to extensive consultation in the development plan process, such as allocations, which were objected to and consequently may not have been considered in depth in the independent scrutiny and any public examination. It is recommended that public be engaged through parish councils or citizen panels comprised of a range of members of the local community and other approaches such as media, website etc.

Government guidance for public involvement in the planning system (specifically on planning proposals) makes it clear that it is up to local authorities to decide on the appropriate method of consultation. The guidelines suggest the objective of pre-application discussions should be to confirm whether the principle of the development is acceptable and to clarify the format, type and level of detail required for local authorities to determine an application (ODPM 2004a). The need for pre-application discussions is also raised in *Planning Policy Statement 23* (PPS23) where it is suggested that these discussions may help identify whether the land may be affected by contamination and if there are other implications from the development proposal (ODPM 2004d). The guidance on pre-application discussions emphasises the need for proactive engagement on the part of the applicant, the WPA and the pollution control authority (e.g. the local Environment Agency) in tailoring the consultation approach to the nature of the application.

The tiered approach is useful for local authorities in determining which applications are to be subject to different types of community involvement. However, there appears to be less guidance from government on the level of community involvement required, and the methods most suitable at each stage of the planning process. Although local authorities are encouraged to involve communities and stakeholders early in the planning stage, issues such as the need to hold pre-application discussions 'without prejudice' and the need to ensure the 'confidentiality' of discussions need to be addressed in more detail in government's guidance (Environment Council 2007a). The call for a more localist approach to waste management will require SCIs to provide for more robust community representation and engagement, so that community views explicitly form the basis of waste local

plans (SITA 2010). Setting minimum requirements and standards for community engagement that offer more prescriptive guidance may avoid poor practice and the domination of unrepresentative minority views, where limited and proportionate resources affect the ability of communities to fully participate in decision-making.

2.7: Conclusion

Government guidance is promoting a more fundamental, constructive engagement with communities and stakeholders in the development of waste management strategies and facility plans. In the current climate of increased local choice, there is a greater expectation that local authorities will pursue more effective forms of engagement with the general public and communities while recognising, particularly at the facility planning level, that different waste proposals will require different forms of engagement. A strong emphasis is placed on effective involvement and interaction with communities and stakeholders, where three specific characteristics have been used to define 'effective involvement':

- *front loading* – where communities and stakeholders are engaged early in the process as opposed to the latter stages when the draft strategy of facility proposal has been developed;
- *accessibility* – where methods are fit for purpose, transparent, relevant to the experience of communities;
- *continuity* – includes several opportunities throughout the process for communities and stakeholders to express their views and shape the direction of the policy or planning proposal.

This reflects a more general framing of the waste management problem around social and technical issues as opposed to purely technical issues. However, some characteristics of effective engagement such as early public involvement (at both strategic and facility planning levels) is deemed to be largely 'desirable' and not mandatory (required by law). While the 2010 *Localism Bill* envisages communities will play a lead role in waste management decision making, there are questions regarding the nature and level of collaboration possible between local authorities and communities in delivering waste policies, services and infrastructure. Government's tendency to be less prescriptive on early public involvement may be linked to the

difficulties inherent in gaining public interest in waste issues at the strategic level, characterised by discussions of wider environmental issues as opposed to localised issues of more concern to the community. However, more localist approach to decision-making demands prescriptive guidance from the Government on the minimum requirements and standards for community engagement to avoid bad practice.

The requirement for community and stakeholder involvement in facility planning (Section 2.6.3) suggests that the widest level of involvement is needed for: (a) potentially controversial technologies (e.g. EFW incineration) that has not been subject to extensive consultation or public enquiry; (b) some technologies that are likely to have an impact on the environment by virtue of factors such as their nature, size and location, and (c) other technologies that may have significant impact on the environment such as hazardous waste landfills. Although there is a desire for local authorities to involve communities and stakeholders early in the planning stage, there is concern about the ability to hold pre-application discussions without prejudice, since issues are focused on localised risks which may have different perceptions in relation to significance of risks (or impacts). A more localist approach to waste management is driving forward suggestions (e.g. SITA 2010) that Government stipulate the exact location of allocated sites and locational criteria (subject to public consultation) in waste local plans.

The lack of guidance for negotiating the level of community and stakeholder involvement early in decision-making, particularly at the strategic level, necessitates some consideration of the theoretical and practical basis for designing a consultation process that may be perceived as fair and legitimate to the general public. Therefore, the next chapter seeks to establish a rationale for 'early public involvement' and reviews the theoretical bases and political structures supporting more deliberative and participatory approaches to decision-making.

Chapter 3: Rationale, Theoretical Perspectives and Approach to Public Involvement

This chapter draws out the main issues from the extensive literature on public involvement, particularly in developing environmental policy. It explores the appeal for more participation through the use of deliberative and participatory methods by examining their origins within political theory, and the deliberative governance and public involvement literature. It then focuses more specifically on the use of analytical-deliberation (a process that combines technical analysis and stakeholder deliberation) as a means to foster a constructive partnership between science, government and society, thus improving risk decision-making. The chapter goes on to identify the potential contributions of deliberative and participatory processes, focusing on UK and international experiences with analytical-deliberative methods to draw out key learning principles.

3.1: Definition and interpretation of public involvement

The Aärhus Convention (1998) proposed greater levels of public involvement in environmental decision-making as a means to: (1) establish institutional credibility through greater transparency and accountability; (2) develop citizens' empowerment by acknowledging their rights to take part in policy decisions; (3) enhance dialogue and access to information by giving citizens better access to information and more opportunities to express their concerns; and (4) foster social responsibility by encouraging authorities to take account of public concerns in the final decision (UNECE 1998). Public involvement is used as an umbrella term and includes (Environment Council 2007a):

- *public participation (or consultation)* that usually refers to the involvement of stakeholders and the general public on issues related to strategy and policy development
- *stakeholder and community involvement (or engagement)* usually refers to the involvement of stakeholders and communities on specific site proposals

The term public participation implies a popular democratic notion of ordinary citizens' involvement in policy decisions, and stakeholder and community

involvement is a more pluralist notion of interest group involvement in policy-related issues, usually specific planning decisions (Creighton 2005). For the purpose of this research the term public involvement will be used to encompass both aspects.

In general terms participation means something positive - it implies that someone is cooperating, working with others to achieve a common goal (Krek 2005). The term 'public participation' is a complex concept and the scope and definition is open to debate. According to Rowe and Frewer (2005) a general definition with which few would argue is the practice of involving members of the public in the agenda setting, decision-making, and policy formulation activities of organisations and institutions. This definition enables a distinction to be made between participatory and non-participatory approaches to decision-making. In some cases, the public might be involved by being the passive recipients of information from government bodies or regulators. In other cases, public input may be solicited from opinion polls, questionnaires or focus groups or the public could take a more active role through direct participation in the decision-making process, usually through representation on advisory committees (Rowe and Frewer 2004). The International Association for Public Participation (IAP2) describes the core values of public participation (Table 3.1).

Table 3.1: Core values for the practice of public participation

The public should have a say in decisions about actions that affect their lives.
Public participation includes the promise that the public's contribution will influence the decision.
The public participation process communicates the interests and meets the process needs of all participants.
The public participation process seeks out and facilitates the involvement of those potentially affected.
The public participation process involves participants in defining how they participate.
The public participation process provides participants with the information they need to participate in a meaningful way.
The public participation process communicates to participants how their input affected the decision

Source: IAP2 2000 cited in Creighton 2005, p.8

There is some consensus that the public has a role to play in environmental decisions. However, the proper extent and precise nature of this role are subject to very different interpretations. There are differences in the definition of the public (e.g. special interest groups, the 'general' public) and, why the public should be involved (e.g. to satisfy the democratic rights of citizens, to build knowledge and

raise awareness of environmental issues or to resolve conflicts and build trust between experts and citizens). The following two sections explore these questions, some of the issues raised and their implications for waste management decision-making.

3.1.1: Rationale, assumptions and context for public involvement

Historically decisions affecting the public, particularly environmental risk decisions have been made with input from selected stakeholders. This has primarily included those with public responsibility for decisions (e.g. local authorities) and those with technical expertise in the appropriate area (e.g. scientists and engineers) (Jasanoff and Wynne 1998; Stern and Fineberg 1996; Laird 1993). International guidelines such as the Aärhus Convention encourage governments to adopt more deliberative and participatory decision processes but there are different perspectives on the benefits of involving the public in policy decisions. For instance, public involvement is often argued as necessary because "public support is necessary to implement policy" (Renn *et al.* 1995; p.6). However, this has not gone unchallenged: "public participation and consensus-building is over-rated as a policy tool" (Nichols in Minard *et al.* 1993; p.31).

In an examination of the rationale for public involvement in comparative risk assessment, Perhac (1998) argues that only in the context of specific situations can the question of who constitutes the public be meaningfully pursued. According to Fiorino (1990) there are three compelling rationales for broader participation, particularly in environmental or risk decision-making. These have been classified as *normative* (based on citizens' democratic right to participate), *substantive* (the epistemic argument on the relevance of different types of knowledge in the decision process) and *instrumental* (based on the premise that it builds trust and avoids controversy over decisions). These are not mutually exclusive and are often used interchangeably in the literature.

The *normative* or political rationale derives from the principle that citizens have the right to participate meaningfully in decision-making and to be informed about the basis for government decisions (UNECE 2000; Perhac 1998; Fiorino 1990). The assumption made is that potential conflicts could be addressed and overcome

through a democratic decision process, where government needs consent of the governed to claim legitimacy. Traditionally the defining characteristic of democracy is the public's right to elect members of government, who are then armed to make policy decisions in the best interest of society. The elected officials then hold the administration accountable for implementing these decisions. However, the greatest problem has been government's inability to ensure the preferences of the public are expressed in decisions taken (Creighton 2005; Fraser 1997).

In environmental management there is evidence in the literature to show the interests of public authorities' sometimes conflict with that of the public. For example, public opposition to decisions on localised environmental issues such as siting hazardous and municipal waste facilities presents a clear-cut political case for the necessity of public involvement (Snary 2002; Elliot 1998; Petts 1992,). In municipal waste management, the UK Government is reacting to these pressures by encouraging local authorities to adopt a more deliberative and participatory approach to decision-making (see Section 2.5). The UK government is encouraging public involvement which is targeted at, and easily accessible to, those with a clear interest in the policy issue. The principle is that effective participation brings to light valuable information which can be used to design effective and acceptable solutions (BERR 2008).

According to Rydin and Pennington (2000) the political rationale sees the policy process "as a locus for the articulation of values and preferences on policy options, and participation is a means of bringing the pattern of values and preferences represented within the policy process closer to that existing within society as a whole" (p.153). In this context, Perhac (1998) suggests that the question of how the public is defined for purposes of public involvement becomes the question of whose acceptance is necessary for political viability. In cases where decisions concern localised environmental issues such as siting waste facilities, political viability may define the public in terms of special interest groups with political clout (e.g. a local action group). For decisions that involve wider environmental issues such as local waste policy, political viability may define the public as individuals regardless of their affiliation with special interest or lobby groups.

The *substantive* or epistemic rationale is based on the premise that participation by diverse groups and individuals will provide essential information and insights which may contribute to developing a more 'effective' policy (Perhac 1998; Fiorino 1990; Jasanoff 1987), because relevant knowledge in policy development is not exclusive to experts and public knowledge (i.e. local or anecdotal knowledge) is relevant to decision-making and necessary to achieve a greater level of consent for policy decisions (Healy 2004; Pellizzoni 2003; Young 2000; Lafferty 1999; Lafferty and Eckerberg 1997).

According to Perhac (1998) the epistemic rationale, in its most radical form, challenges the scientific understanding (and characterisation) of risks. The risk perception literature suggests there is a tendency for technical experts "to view objective characterisation of risk, illuminated by experts' calculations, as somehow more real or more valid than the perceptions of the rest of the public" (Kasper 1980; p.77). This is evidently the case in waste management where the role of the public has been marginal, particularly in identifying risks associated with siting waste facilities (Davies 2003). In the US, there has been criticism concerning the emphasis placed on the application of technical knowledge, expertise and techniques of problem solving, which does not legitimately address local groups' and residents' risk perceptions (McAvoy 1999). Petts (1994) argues that experts' assessment of risks may be judged on a similar level as that of an ordinary citizen because "at some point someone has to make a judgement as to the likelihood of an event based upon incomplete knowledge and understanding" (p.212). However, this is not to say that experts' judgement is not relevant to the process as public involvement cannot offer assurances regarding, for instance, the protection of the environment (Webler and Renn 1995).

Stern and Fineberg (1996) suggest the values and judgement of citizens may complement that of expert because "the public (or non-specialists) may contribute substantially to risk characterisation[16] - for example, by identifying aspects of hazards needing analysis, by raising important questions of fact that scientists have

[16] "Risk characterisation is defined as the synthesis and summary of information about a hazard that addresses the needs and interests of decision makers and of interested and affected parties". (Stern & Fineberg 1996; p. 216)

not addressed, and by offering knowledge about specific conditions that can contribute more realistic assumptions for risk analyses" (p.23). The premise is that public involvement allows for the explicit examination of social, ethical and political values that cannot be addressed solely by analytical techniques but also requires deliberation with a wide group of interested and affected parties. This generates greater breadth and depth of information by integrating the knowledge and views of both scientific experts and the public (Leksmono *et al.* 2010). Habermas's (1984) thesis on reasoning suggests three types of knowledge are relevant to decision-making. The first is 'technical rationality' (expert or technical knowledge) concerned with factual arguments about issues such as the nature and extent of environmental damage and the relevant methodologies to assess such damage. Technical debates are usually low in intensity and lack emotional content – they are resolved by reference to objective analysis and the issues are discussed in terms of 'correctness' not 'appropriateness' or 'goodness' (Glicken 1999; p.301). Moral (or cultural) rationality and emotive-aesthetic rationality relate to public or local knowledge which includes value-based knowledge (related to personal values and ethics) and experiential knowledge (related to emotive experiences) (Renn *et al.* 1991).

The *instrumental* rationale for public involvement promotes acceptance and implementation of decisions. It may also decrease conflict and increase trust in decisions made by government agencies (Fiorino 1990). In situations where risks are attributed and distributed among communities, the lack of trust in responsible authorities is a problem in most instances (Slovic *et al.* 1991). According to Slovic (1993) the psychological tendency to notice, believe, and give more weight to information that destroys rather than builds trust; and social factors, such as the tendency of mass media to favour bad news, makes trust very fragile. For example, mistrust is recognised to be the root of conflict between authorities and local residents in siting waste facilities (see Petts 1992; Covello 1992). Opposition in siting decisions has emerged from factors such as perceived inequality and unfairness (Adger 2002; Elliott 1998; Petts1992) and the motives of residents who feel these risks are imposed on them concern issues such as injustice, equity and ethics (Aldrich 2008); and 'distributional fairness' and 'fairness of process' (Wolsink 2007).

The motivation for public involvement in this context is related to a desire to achieve a decision process that will be perceived as equitable or fair (Smith and MacDonough 2001). Some authors suggest that improving risk analysis and risk characterisation may have little practical effect on reducing opposition to decisions without efforts to rebuild trust through public involvement (Slovic 1993; Leroy and Nadler 1993). Other authors are more sceptical and question whether the trust and credibility of a government, if lost, could ever be regained (Covello 1992). However, the argument from a policy delivery perspective is that involving parties early in the decision process may avoid possible conflict later on and contribute to improving the overall legitimacy of decisions taken because clear up misunderstandings about the nature of a controversy and it may contribute to generally building trust in the process, with benefits for dealing with similar issues in the future (Stern and Fineberg 1996).

3.1.2: Constituents of the public

Each rationale for public involvement emphasises the importance of incorporating a multitude of interests (and values) in decision-making. Petts (2004) argues that the articulation of these interests and values are often not made explicit enough. They tend "to be promoted as an all embracing term referring to non-expert or non-decision-makers' concerns. However, this can lead to a loss of important distinctions between stakeholders that have 'interests' – often direct, financial or regulatory, and people's 'values' expressed through their beliefs, attitudes and 'worldviews'" (p.116). In waste management, government guidance on public involvement identifies a number of key stakeholders and community groups with common or shared interests (see Section 2.6). However, in cases where interests are not organised (e.g. informal groups and individuals affected by the decision), members of communities are potentially less able to engage in decision processes.

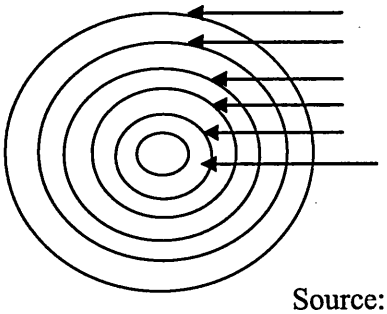
Creighton (2005) suggests the most frequent problem with ensuring that the people participating in the decision are in fact representative of the public is a failure to include the full range of opinion, and a failure to include interests for whom there is no obvious mechanism for representation. For instance, in discussing public concerns in relation to siting waste facilities, Petts (1994) suggests it is easy to characterise everyone other than the proponent and statutory authorities as 'the

public' but in practice this suggests a uniformity of group, interest, knowledge and concern that is rarely (if ever) apparent (p.209). Petts concludes that the tendency to believe that everyone in the local community will have the same views can lead to a misunderstanding of information requirements, and a failure to communicate ideas and plans effectively.

Creighton (2005) suggests the public for any issue or decision consists of those who see themselves as having a stake in the decision. As a result, the public is different for each issue or aspect related to the decision. According to Stern and Fineberg (1996) each risk decision has a spectrum of interested and affected parties who vary in terms of their knowledge base, views or perspectives of the situation, values, concerns and personal interests. Petts (1994) suggests the interested parties will change dependent on whether the situation involves different projects, plans or different locations for waste facilities; she concludes: "it is not possible to approach every new issue in exactly the same manner as the last, and even during the life of a single proposal, or operation, issues will change and different groups or interests will leave or join the discussion" (p.209). Creighton (2005) argues it is important to ensure that (1) key stakeholders are not left out, (2) the parties interested in the specific decision are targeted, and (3) the potential level of controversy is properly assessed before selecting participants. In this context, there is a need to recognise that the public may hold many disparate views.

In a study that investigated the trends in public participation in local government decisions, Lowndes *et al.* (2001a/b) suggests an understanding of citizens' attitudes and behaviour is necessary if practitioners are to address the problem of 'apathy' (and social exclusion) that plagues participation initiatives. There is some value judgement that goes into defining the public and deciding who needs to participate in the decision process. An approach developed by Aggens (1983) considered the public in terms of their level of interest in and influence on decision-making (Figure 3.1).

Figure 3.1: Orbits of participation: role of 'the public' in the decision process



Source: Aggens in Creighton 2005; p.53

Aggens portrays the public as consisting of six orbits: decision makers, active participants, technical reviewers, commenters, observers and unsurprised apathetics. She said "think of each level as an 'orbit' of activity around the project nucleus – the decision-making process. The closer an orbit of activity is to this decision-making centre; the greater the opportunity there is for public influence in that decision" and; the greater the level of concern or interest of individuals in the issue or decision (Aggens in Creighton 2005; p.53).

The public is considered external to the organisation and there is an implication that people can move from an outer orbit to a more active orbit, either because they are encouraged to participate at a higher level or their level of interest and concern has increased (Creighton 2005; Aggens 1983). Each category of participants has been modified to reflect typical groups that participate in waste management decision-making (Defra 2005g). A profile for interest groups in the context of municipal waste policy is summarised in Table 3.2.

Table 3.2: Profile of interest groups in municipal waste policy

Main category	Sub category	Interest in the decision process	Examples
Local authorities	Co-decision makers (internal partners)	The ultimate authority to make the final decision	Elected Members; Waste managers; Planning officers
Key stakeholders	Technical reviewers (external partners)	Share some decision-making authority (in one form or another)	Defra/Government Office; Environment Agency; Waste Management Industry; Regional Development Agency
	Observers (wider interest groups)	Have the right to make an 'informed' comment on waste management proposals / plans	Community Recycling Network; Greenpeace/FOE; Countryside Agency; English Heritage

Table 3.2 (continued): Profile of interest groups in municipal waste policy

Main category	Sub category	Interest in the decision process	Examples
Citizen groups	Unsurprised apathetic (general public)	Little interest in waste issues but given the opportunity to participate	The general public (potentially an infinite number of people)
	Commenters (local interest groups)	Some interest in waste issues but not willing to make long term commitments to participation initiatives	Youth, Religious and Recreational Groups; Local Businesses; Chambers of Commerce
	Active participants (local community/activist groups)	High interest in waste issues and generally willing to make long term commitments to participation initiatives	Local Action Groups; Environmental Campaign Groups; Housing and Residents Associations

Source: Defra (2005g); Aggens (1983)

3.2: Public involvement in local governance

Declining trust in public institutions, the rise of social movements, public sector change and new expectations of service quality have made elected officials sensitive about the legitimacy of the decisions they make. Hence public involvement has become an attractive strategy not just for policy improvement but to draw dissatisfied citizens back into the political mainstream (Davis and Bishop 2002). Historically public involvement in local governance has been limited to approaches such as surveys, opinion polls and public meetings that either assess public satisfaction with local services or form the basis of education campaigns that target behavioural problems in relation to social or environmental issues (ODPM 2002). However, the 'democratic renewal' of local governance (Pratchett 2000) changed the role of communities and individuals. For instance, the 2001 local government White Paper *Strong Local Leadership – Quality Public Services* emphasises that the importance of ongoing public participation is vital to enhancing the democratic legitimacy of local government, the development of community leadership and in improving service delivery. In addition, the 2006 White Paper *Strong and Prosperous Communities* emphasises the importance of local authorities providing leadership for local areas and communities, democratic accountability for a wide range of public services and in enabling communities to comment on the issues that most concern them.

The idea of public involvement has been associated with pluralism and deliberative democracy, which is gradually replacing the managerial model of public

administration (e.g. Dryzek 1997; Laird 1993; Reich 1985). This democratic renewal agenda encourages aspects of deliberative democracy – a system of political decision-making based on some trade-off between consensus (i.e. inclusive) decision-making and representative democracy. In contrast to the idea of representative democracy, where voting (i.e. a majority system) is central to democracy, deliberative democracy theorists argue that legitimate policy can only arise from public deliberation of the issues (Cohen 1989).

The idea of democratic renewal follows closely from an understanding of a political process concerned with changing the attitudes and behaviour of citizens to fit a new mix of institutions and practices. Pratchett (2000) suggests the new mode of democracy that the renewal process offers depends on the successful combination of: (a) a discrete set of proposals, each of which address specific failings in contemporary democracy, (b) a broader strategy which seeks to draw upon existing institutions in order to alter citizen attitudes and their relations with structures of governance, and (c) a new democratic polity which not only improves the effectiveness of existing practices but also draws upon different components of direct, consultative, deliberative and representative democracy to create a new democratic order.

3.2.1: Overview of local governance in the UK

Over the past two decades, there has been significant change in the management of local authorities in the UK. The traditional bureaucratic, paternalistic approach to decision-making is gradually being replaced by a more responsive and democratic model:

> "The essence of democracy itself is now widely taken to be deliberation, as opposed to voting, interest aggregation, constitutional rights, or even self-government. The deliberative turn represents a renewed concern with the authenticity of democracy: the degree to which democratic control is substantive rather than symbolic, and engaged by competent citizens" (Dryzek 2000; p.1).

Some researchers have noted differences between old and new forms of local governance (Table 3.3). The first is the transformation of local government from the role of 'central player' in the development and delivery of services to 'strategic enabler', the manager of a number of service providers. Cochrane (1993) suggests the idea of an enabling local authority is for it to be one of many policy players, but not necessarily the most dominant. The principle underpinning this 'enabling' form of governance is that local authorities should seek to widen their remit by simultaneously drawing in new types of service providers, particularly private sector operators, while developing responsive, user sensitive policies and programmes (Imrie and Racot 1999).

Table 3.3: Trends in local government management

Form of governance	Bureaucratic (paternalistic) model (1950s to 1970s)	Democratic model (1990s to present time)
Role of local government	Main developer / provider of services	Strategic enabler of a number of service providers
Objectives of the governance system	Managing inputs, delivering services in the context of a national welfare state	Overarching goal is greater efficiency in tackling the problems that the public most care about
Dominant ideological form of local politics	Professional and party partisanship	Managerialism and Localism
Definition of public interests	By politicians / experts. Little in the way of public input	Individual and public preference produced through a complex process of interaction

Source: Adapted from Kelly *et al.* (2002)

The 1980s witnessed a crisis of trust and confidence in the bureaucratic system of governance by individuals and communities: there were concerns about the remoteness of centralised decision-making along with the apparent insensitivity and lack of accountability of some local authority officers (Hambleton 1992). According to Burgess *et al.* (2001; p.30), it was commonly asserted that local people:

- do not understand who is responsible for delivering their local services
- are often confused about how local authorities make decisions and see them as secretive and overly bureaucratic organisations
- consider that council decisions and the views of the elected representatives do not reflect their own priorities or those of their neighbourhoods
- perceive local authorities as wasting their money

- consider [attempts] at 'consultation' as a means of post hoc rationalisation of pre-determined decisions

During the 1990s it was widely documented that the management of local government was failing and that efforts were needed to revitalise democratic practice (Healey 1997; Pratchett and Wilson 1996; King and Stoker 1996; Leach *et al.* 1996; Weir and Hall 1994; Cochrane 1993). There was significant public dissatisfaction with what was regarded as a 'closed' policy process that was in part, underpinned by the control of technical officers who, while accountable to members, did not necessarily have to justify their actions to the wider public (Imrie and Racot 1999). Local authorities were seen as a dominant and rather domineering player in the provision of local services – professionalism and confident partisanship were the basis of good management. Stoker (2004) suggested that local authorities' actions at the time had a special public sector ethos mandated through the legitimacy provided by the operation of local elections.

A model of complex community governance began to take shape from the mid-1990s onwards (Sullivan 2001). The Labour government reform programme for local government was initiated as a result of the deficiencies of local democracy - i.e. problems of low electoral turnouts and declining levels of public interest in, and commitment to, local government (Rao and Young 1999). The reform programme focused on community consultation and involvement and emphasised a preference for a multiagency 'partnership' approach towards meeting local needs (DETR, 1998a). The government's consultation paper (DETR1998b) *Modernising Local Government: Local Democracy and Community Leadership* argued that ongoing public involvement is "crucial to the health of local democracy" and it recommended "new ways in which councils can listen to their communities and involve local people in their decisions, and in their policy planning and review" (p. 11). The Local Government Act 2000 emphasised the importance of actively involving and engaging the community in local decision-making to better assess potential outcomes of decisions.

The local government reform programme significantly shifted the culture of governance from one that focused on consumerist solutions to more community

based solutions (Morphet 2008; Stoker 2004; Healey 1997). The new order is based on a managerialist ideology which regards social and political issues as technical and/or procedural matters - i.e. matters to be managed (Desai and Imrie 1998). The Government modernisation agenda aimed to redefine the 'new order' by reforming the managerial culture of local governance. The main purpose was to develop policy programmes that reduced inefficiency and waste, and promoted value for money in local government. At the time, the UK Prime Minister, Tony Blair noted that "in a modern welfare state the role of government is not necessarily to provide all social provision but to organise and regulate it most efficiently and fairly" (Imrie 1999; p.6).

Criticism of professionalism and party partisanship as the dominant and legitimating ideology of governance gave rise to the prominence of managerialism and localism. The latter is redefining the political process (complementing institutional forms of managerialism). However, the concept and idea of localism is not new. Dunleavy (1980) defined localism as a focus on the concerns of the community served by the authority. The premise of localism is not to achieve narrow efficiency but 'public value', defined as the achievement of favoured outcomes by the use of public resources in the most effective way (Goss 2001; Stoker 2005). The overarching goal is to meet the needs of the community as defined by its residents, within the context of the demands of a complex system of multi-level governance (Stewart and Stoker 1988). Theoretically this means power is devolved to communities, with local authorities taking an enabling role (Slater 2007). The coalition Government's renewed focus on localism is set to enhance the legitimacy of local government as the public is more integrated in policy discussions and decisions. There is an expectation that more meaningful engagement will create opportunities for the co-production of solutions, thus addressing public dissatisfaction with engagement processes that lack impact in shaping policy or plans (POST 2009). Designing localist solutions puts an emphasis on the need to adequately define the problem, design solutions and assess impacts on the underlying issue (Stoker 2005). With this comes the requirement for local authorities to understand the 'likely' and 'real' impacts of their decisions at the local level.

The success of local governance is no longer a simple matter of efficient service delivery but rather the complex challenge of ensuring a favourable outcome for the community (Stoker 2004). This renewed political process, if only in theory, sees the relationship with the public (or community) as one of constant interaction (Morphet 2008), which represents a move away from 'aggregate' or 'vote-centric' models of democracy (Goodin and Niemeyer 2003) to ones which recognise the longer process of policy formulation as part of formal consultation, rather than formal decision-making, processes (Morphet 2008).

3.2.2: Legitimacy and deliberative democracy

Deliberative democracy emphasises the need to involve all interested and affected parties in decision-making (Gurabardhi *et al.* 2005). Some authors (e.g. Newig and Fritsch 2009a and b) suggest policy acceptance and implementation may be high if decision-making processes are seen to be fair and legitimate. This procedural legitimacy derives from increased opportunities for citizen engagement which forms part of an ongoing critical dialogue upon which more legitimate forms of political authority can be grounded. Deliberative governance promises more trustworthy and legitimate forms of political authority, more informed decision-making and a more active account of citizenship (Crosby and Nethercut 2005), along with higher levels of acceptance and implementation of policy (Newig and Fritsch 2009a and b).

There is, however, significant uncertainty regarding how deliberative democracy is legitimised and institutionalised (Smith and Wales 2001). There are questions about whether it should be seen as an alternative to liberal representative democracy or whether it points to the reform and supplementation of representative structures. A number of approaches to the institutionalisation of deliberative democracy can be discerned. For instance, Cohen and Rogers (1995) have suggested the supplementation of representative government with secondary associations – the establishment of a 'deliberative associative democracy' (a model of participatory democracy in which individual participation takes place in the context of self-governing interest groups or associations). Other suggestions include the institutionalisation of group representation (Young 1990), and the need for process deliberation to legitimise majoritarian decision rules (Habermas 1996; Chambers 1996; Manin 1987).

Dryzek (2001) suggests accounts of deliberative democracy are also accounts of legitimacy interpreted as: "outcomes [of the decision process] that are legitimate to the extent that they receive reflective accent through participation in authentic deliberation by all those subject to the decision in question" (p.651). In this context the concept of legitimacy may be divided into three separate conditions (Table 3.4).

Table 3.4: Legitimate decision-making

Conditions for legitimate decision-making		
Legality	the ability to discuss and decide the rule of civic engagement but yet abide to a minimum set of core principles that governs deliberation	allows citizens the freedom to broadly address the legality of the process but ensures it is compatible with the specific legal and administrative provisions – and that it is made clear who is accountable for the decision outcome
Justifiability	the degree to which decision outcomes match substantive goals of society and are normatively justifiable or desirable, which relays a need for both expertise and local knowledge	adopts a derivative approach to identifying expertise, which should include substantive goals and representation of a wide range of interests
Consent	a balance between traditional vote-centric forms of consent and more deliberative forms that includes a wider range of participation by interested and affected parties	adopts various forms of participation that captures the consent of the range of interested and affected parties

Source: Parkinson (2003); Jones and O'Toole (2001); Estlund (1997); Beetham (1991); Dryzek (1990); Manin (1987)

Dryzek (2001) summarises three approaches for addressing the issue of legitimacy, on the basis that it is achieved at the interface between the public sphere and the state, not in individual small scale deliberations:

1. restrict the number of deliberative occasions to major.constitutional moment (Ackerman 1991) or where the basic structure of society is at stake (Rawls 1996);
2. restrict the number of people who deliberate and ensure they are representative of those who do not;
3. partially substitute internal individual deliberation for social interactive deliberation, making others present via their thoughts and words (O'Neil 2001; Eckersley 2000; Goodin 2000)

These approaches point to the supplementation of representative structures, whereby citizen representation and inclusion are optimised to legitimise the policy process,

particularly on controversial matters where public interest and values are likely to conflict with other stakeholder views. This is supported by other academic commentators who see the purpose of deliberative processes as a means to enhance the function of representative democracy, not replace it, thus complementing existing social and political institutions (Stoker 2004; Beetham 1995). However, there is a need to better understand the contextual or process factors that make deliberative governance desirable at the local level. In modern mass democracies local authorities have recognised that few deliberative processes contribute to clear-cut decision outcomes. Rather, the experience of many local authorities is that participants learn more about the complexities of local government and the views of participants in the process – in this respect; the value of deliberation is the actual participation (Pratchett 1999). Hence, more opportunities for deliberation should not be seen as the sole means of extending democracy. Pratchett (2000) suggests in order for the democratic renewal process to be effective, it requires the appropriate mix of direct, consultative, deliberative and representative mechanisms so that citizens are not alienated from the institutions of local democracy (Pratchett 2000). One of the main challenges is managing the tensions inherent in combining different components of traditional representative and deliberative approaches to democracy.

3.2.3: Two models for decision-making

The conventional model of the relationship between political power and scientific knowledge assumes a clear distinction between 'objective knowledge' and 'subjective values' and normally reduces a range of options to an objectively determined singular best decision. Commonly labelled the 'technocratic' model, it reduces politics to a scientifically rational administration where the politician is fully dependent on the expert (Weingart 1999). It assumes that decisions regarding technological and social hazards should be made by experts and scientists with the relevant knowledge (Gurabardhi *et al.* 2005; Löfstedt 2004; Rowe and Frewer 2000). In this model, the process is centred on discussion for action rather than any underlying beliefs and values, and experts are responsible for resolving the impact of uncertainty arising from alternative interpretations of the decision. This epistemic function, that is, the expert's role in providing reliable answers to problems, makes it an inherently desirable commodity in political decision-making.

The technocratic model implies that the public has no part to play in identifying risks associated with decision-making. Some authors suggest involving the public can result in decisions that are not technically sound and may produce options that are uneconomical and ill-equipped to deal with potential risks (Gurabardhi *et al.* 2005; Löfstedt 2004; Rowe & Frewer 2000). Rutgers and Mentzel (1999) suggest the claim to knowledge put forward by the expert, or the claim of the policy maker to privileged practical, moral and/or political insight can be contrasted to a more sociological perspective where communication, legitimisation, and power become the central concepts in order to understand the expert-policy relation. The underlying question in each case concerns the validity of scientific knowledge in social reality. Lindblom and Cohen (1979) put forward a plea for 'partisan analyses' where every group has its own expert. Rutgers and Mentzel (1999) conclude that this seems to remedy the great demand for expert knowledge in terms of its power to get things done.

Weingart (1999) acknowledges problems associated with high reliance on scientific expertise in policy-making. He claimed increased use of scientific expertise by policy makers does not increase degrees of certainty but in fact de-legitimises outputs and results in the loss of authority of scientific expertise. Additionally the institutional framing of policy problem reflects a strategic interest-based manipulation of the issues, thus closing down opportunities for wider debates (Pellizzoni 2003; Irwin 2001). The crucial and problematic assumption of the technocratic model is the notion of a one dimensional direction of scientific and technical development (Habermas in Weingart 1999). To address the issues associated with the technocratic model, Habermas introduced a democratic model based on a reiterative communication process between politicians and experts. He envisaged that the development of policies would be directed by an interpreted value system, and, at the same time, the interests reflected in these value systems would be controlled by examining them in light of technical possibilities and the strategic means of their satisfaction.

According to Weingart, Habermas's model captures best the iterative process of the definition of problems, their translation into policy issues, their re-definition in light of available new knowledge, and the translation of knowledge into decisions. In

contrast to the technical view, the democratic perspective (embedded in the political concept of deliberative democracy) considers risk decision-making as a constructive dialogue among policy officials, stakeholders and the general public. It concerns issues such as justice and fairness and focuses on the claim that ordinary citizens should be able to co-determine decisions that affect their livelihood/security, safety and health (Renn *et al.* 1995; Fiorino 1990). However, some researchers suggest the democratic model may be seen as a threat to the identities of experts, elected officials and policy makers (Petts 2004; Renn *et al.* 1995) who favour the 'tyranny' (Cooke and Kothari 2001) or 'technocracy' (Chilvers in Chilvers 2007) of decision-making.

The technocratic and democratic models represent two sides of a 'legitimisation dilemma'. In principle, the democratic model based on a form of consensus decision-making suffers from poor rational support or justification of outputs, whereas the technocratic model based on representative decision-making suffers from the lack of legitimating public consent (Weingart 1999). According to Weingart, modern mass democracies assess the legitimacy of public decisions on the basis of whether they are rational in light of existing knowledge and made by representatives of delegated power. The legitimising authority for the former is science, which brings experts into governments and for the latter is public support. According to Krimsky and Plough (1988), the rationales for the democratic (or cultural, as they termed it) and the technocratic perspectives are summarised in Table 3.5.

Table 3.5: Rationale for technocratic vs. cultural (democratic) perspectives

Technocratic	Cultural (Democratic)
Trust in scientific methods, evidence and explanations	Trust in political culture and democratic process
Appeal to authority and expertise	Appeal to folk wisdom, peer groups and cultural tradition
Boundaries of analysis are narrow and reductionist	Boundaries of analysis are broad and include use of analogy and precedent
Risk is depersonalised focusing on measures of statistical variation and probability	Risk is personalised with emphasis on impacts on the community and family
Concerns and issues that cannot be described or clearly expressed are irrelevant	Unanticipated or unarticulated issues or concerns are relevant

Source: Krimsky and Plough (1988)

Renn (1998) said an effective decision process is one that includes deliberative and participatory approaches that combines technical expertise, rational decision-making,

and public values and preferences in a fair and equitable way. Krimsky and Plough (1988) suggest that policy officials should consider both the technical and the so-called 'cultural' perspectives of a risk situation. Weingart (1999) concluded that a new conceptualisation of the relationship between science and politics may be required in order to legitimise public decisions.

3.3: Public involvement in science policy

The link between science and politics has attracted attention both in society at large and in scientific studies. The rise of global environmental regimes has meant that models of scientific advice at the local level now extend to multilateral scientific assessment (Miller 2001). Major environmental issues such as climate change, management of natural resources and pollution incorporates complex dynamic interactions between ecological (or environmental), social and economic issues, laden with uncertainty since scientific knowledge of global environmental risk is limited, provisional and value-laden (Sarewitz 2000; Saward 1993). Moving science towards sustainable development means that "science must be created through the process of co-operation in which scholars and stakeholders interact to define important questions, relevant to evidence, and convincing forms of argument" (Kates *et al.* 2001; p.642). There is an expectation that this level of interaction will enable the public to take ownership of science, engage with complex issues, and ultimately influence the direction of science and policy.

A new vision that harnesses the goals of sustainable development suggests a more open relationship between science and society. For instance, the USA National Research Council has suggested the scientific advisory process to public policy (e.g. renewable energy) be open to broader participation (Stern and Fineberg 1996). Similar views were expressed by the House of Lords Select Committee on Science and Technology set up in recognition of the loss of authority of science in society, particularly after the BSE (mad cow disease) crisis, in its report *Science and Society* (2000). The EU, in a White Paper on *Democratic Governance* (2001), in collaboration with a working group on *Democratizing Expertise,* announced guidelines "on the collection and use of expert advice in the Commission to provide for the accountability, plurality and integrity of the expertise used" (COM 2001;

p.19). And European Commission produced a Green Paper in 2007 on the *European Research Agenda* which gave particular attention to 'sharing knowledge' – developing new channels and innovative approaches for communicating and discussing science, research and technology.

Lastly and perhaps most importantly, the European Commission (2007c) Expert Group on Science and Governance produced a report which considered how to address urgent policy challenges that are often taken as strongly scientific in nature (i.e. climate change, sustainability, environment and development). These reports were discussed extensively at an EU Conference: *The Future of Science and Technology in Europe* – at which the 'Public Engagement in Science' session explored European public opinion on science and recommended that the approach to public involvement should respond to the differing conditions, when local or regional responses would be more appropriate than a Pan-European one.

3.3.1: Public knowledge and engagement in science

In response to the 'crisis of confidence' in science policy (and regulatory decision-making), interest in the potential for participatory and deliberative approaches to risk assessment and management has escalated in recent years (House of Lords 2002). Wilsdon and Willis (2004) suggests it is possible to identify three phases in debates over the relationship between science and society moving from (a) activities designed to identify gaps in people's knowledge of scientific facts, to (b) seeking opportunities to fill a knowledge 'deficit' of the public, and finally to (c) some recognition (if not total acceptance) that the public has a valid contribution to make to the policy process. The noticeable shift from trying to educate the public to engaging them in science is illustrated by much practical experimentation with public dialogue and social reflection by scientists (European Commission 2007b). The European Commission (2007c) suggests that a closer relationship is sought between science, civil society and the public:

> "In the perceived pressing need to encourage [technological] innovation, democratic governance has become dislocated in ways that cannot be remedied by technical methods and tools alone. Policy making should not stop at simple or mechanical solutions; it should address the complex issue of

science and governance honestly, thoroughly, patiently and with humility" (p.12).

The relationship between science and society has been characterised as one where scientists produce 'reliable knowledge' on the problems and challenges of society and merely convey its discoveries to interested and affected citizens. According to Gibbons (1999) "there has been a social contract between science and society, an arrangement built on trust which sets out the expectations of the one held by the other, and which – in principle – includes appropriate sanctions if these expectations are not met" (p.11). However, a breakdown of trust has stimulated a shift in the relationship between science, expert knowledge and citizens in democratic societies. This has redefined the 'social contract for science' characterised by an ascendancy of participatory paradigm in science policy. The European Commission's 2005 Science and Society Action Portfolio reflect this shift:

> "Following the Enlightenment, progress in science and technology was considered to be a goal in its own right. But today, science is no longer viewed unquestioningly as the harbinger of better times. Society's view of scientific inquiry has become more sophisticated and nuanced ... The gap between the scientific community and society at large has widened ... People are not willing just to sit by and let the scientific community and the politicians set the agenda" (p.2).

According to Weingart (1999) the politicisation of scientific knowledge has eroded the authority and legitimacy of science as objective knowledge which has led to a loss in credibility of the policy process. This erosion of the legitimating function of science in certain instances has spurred calls to make science more accountable and democratic (Bäckstrand 2003). Subsequently, the new social contract for science is based on the assumption that "the interaction between science, civil society and the wider public can generate new forms of social intelligence and create mutual benefits by stimulating new directions for [technological] innovations" (European Commission 2007b; p.12). This requires wider participation in scientific assessment beyond a narrow group of scientists. Wynne (1994) argues that the incorporation of lay knowledge in scientific assessment does not rest on the assumption that lay

knowledge is necessarily better than expert knowledge. However, the uncertainty of future environmental outcomes such as possible disasters or ecological catastrophes necessitates a multiplicity of views which can restrict the tendency to narrow down alternatives.

The changing relationship between science and society is driving models of citizen deliberation, particularly in environmental decision-making. One of the most prominent examples was the Royal Commission on Environmental Pollution's 21st Report, *Setting Environmental Standards* (1998). The Royal Commission suggested that a far wider group of people are regarded as 'having an interest in' regulatory decisions on the environment; and that expertise on environmental problems is much more widely spread out to include local interest groups and wider environmental groups (RCEP 1998; p.103). The report advised governments to take bold steps in adopting more deliberative and participatory methods that ensure citizens' values, along with local knowledge and understanding are considered alongside technical and scientific considerations (p.101).

The Royal Commission recognised that environmental decision-making is most concerned with evaluating multilateral risks (i.e. of social, environmental and economic context) and proposed that citizens' values, through deliberation and syntheses be incorporated into decision-making processes. It was recommended that the public be involved in 'setting strategies, rather than merely being consulted on already drafted proposals' (p.101 and 136). These guidelines seem to suggest that a close partnership is sought between regulators and the public (Steel 2001) – a desire that is also reflected in more recent recommendations for early public involvement in the development of waste strategies and facility plans as discussed in Chapter 2.

3.3.2: Risk regulation: government's role in the process

The Cabinet Office Strategy Unit (COSU) suggests Government has three overlapping roles and related responsibilities in the context of risk regulation (Table 3.6).

Table 3.6: UK Government's role and responsibilities in risk regulation

Risk Context	Role	Responsibilities
Technological and social hazards	Regulatory	Where individuals or business impose risks on others, Government's responsibility is to monitor and control the level of impact.
Natural hazards	Stewardship	Where risks imposed cannot be attributed to any specific individual or body, the Government would be responsible for providing protection or mitigating the consequences of impacts.
Operational and policy risks	Management	In relation to its own business, including the provision of service to citizens, Government is responsible for identifying, monitoring and controlling the risks.

Source: COSU (2002; p.20 - 34)

In relation to operational and policy risks the Government's role, as conceived by the Strategy Unit, is to communicate the risks to citizens by educating them on issues of 'real' importance and correcting misperceptions and misunderstandings. Usually the focus is on persuading people to accept expert judgements, or calming down the concerns of citizens (Gurabardhi *et al.* 2005).

The uncertainties associated with novel threats inherent in modern societies is driving policy makers to involve a far wider range of stakeholders in decision-making so as to engage with community views, knowledge and values regarding public issues (Dryzek 1990). In this case, risk has a non-technocratic, values-accommodating definition, where according to Rosa (1998); a risk may be considered "a situation or event in which something of human value (including humans themselves) has been at stake and where the outcome is uncertain" (Rosa, 1998, p. 28).

The UK Inter-Departmental Liaison Group on Risk Assessment (ILGRA) (now the HM Treasury's Risk Support Team) suggests risk regulation at government level should have risk communication as a central element. Three steps are suggested (ILGRA 1998; p.3):

(a) problem framing - this must include various perspectives of the risk, i.e. both 'real' and 'perceived' impacts,
(b) examining options - this includes both factual and subjective judgements,
(c) adopting decisions - the regulator supplies information to decision makers (who could be a mix of officials, elected representatives, individual

citizens), supports the decision process and helps communicate and justify centrally made decisions

ILGRA sees the risk communication as an integral part of the regulatory process which extends beyond providing people with information and includes establishing two-way dialogue with stakeholders and communities. The pan-European think tank, TRUSTNET, advocates a more democratic concept of risk governance that influences the credibility, effectiveness and legitimacy of the regulatory framework for hazardous activities. Their risk governance paradigm is based on 'mutual trust' and characterised by a broad involvement of stakeholders in risk assessment and management as well as in the justification of hazardous activities. The defining characteristics of inclusive risk governance focus on the process of decision-making as "only time will tell whether the decisions, as opposed to the decision-making process, are substantially good" (European Commission 2004; p.11):

- empowering affected individuals and groups by allowing them to contribute earlier in decision-making
- establishing clear roles for participants in the process, including scope and limitations to set conditions for mutual respect and trust;
- ensuring all interested and affected parties recognise the decision-making process as transparent, fair and legitimate
- promoting mutual understanding and confidence between participants and develop competence in participative (or deliberative) systems of governance
- outlining how the contributions from participants and experts were used to inform the decision; and
- producing decisions or strategies that are practical to implement (i.e. are flexible and adaptable)

This is an inclusive concept of risk governance, which is recognised as an integral supplement to representative democracy. It opens-up the political process, involving concerned stakeholders where possible to justify the activities that give rise to social concerns in the relevant context (European Commission 2004). The TRUSTNET framework for risk governance is intended to improve the relationship between public authorities, experts and stakeholders in the context of hazardous activities.

3.3.3: Role of analysis and deliberation in science policy

The United States National Research Council (NRC) has highlighted the roles of both scientific and value-based input for effective decision-making and identified the need to find a balance between analysis and deliberation in risk-based decision-making. According to the NRC "deliberation frames analysis and analysis informs deliberation" (Stern and Fineberg 1996; p.6). They can be thought of as two complementary approaches to gaining knowledge about the world, forming understanding on the basis of knowledge, and reaching agreement among people. Analysis uses rigorous replicable methods to produce factual evidence on which to base decisions while deliberation is an interactive, reflective and persuasive process used to discuss, communicate, raise and collectively consider issues and increase understanding to arrive at substantive decisions.

According to the NRC, government agencies should start with the presumption that developing decision-relevant understanding requires both analysis and deliberation at each step of the process leading to risk characterisation. The aim of analytical-deliberative processes is to integrate technical analyses with scientific analyses of the social contexts, within an explicit decision-making model with clear criteria, and involving stakeholders and the public, in contrast to the more traditional top-down regulatory approach, which is well established in the literature (e.g. Culyer 2005). The premise for analytical-deliberation is based on a number of issues associated with environmental decision-making to which greater levels of public involvement potentially address. Some of these include: lack of public knowledge about wider environmental issues, inadequate consideration of public values and preferences, unexplored opportunities to correct mistakes or find innovative solutions, public mistrust of experts and the relevant authorities resolve to protect the health of local people and the environment, and a prevailing culture of conflict (Beierle 1999).

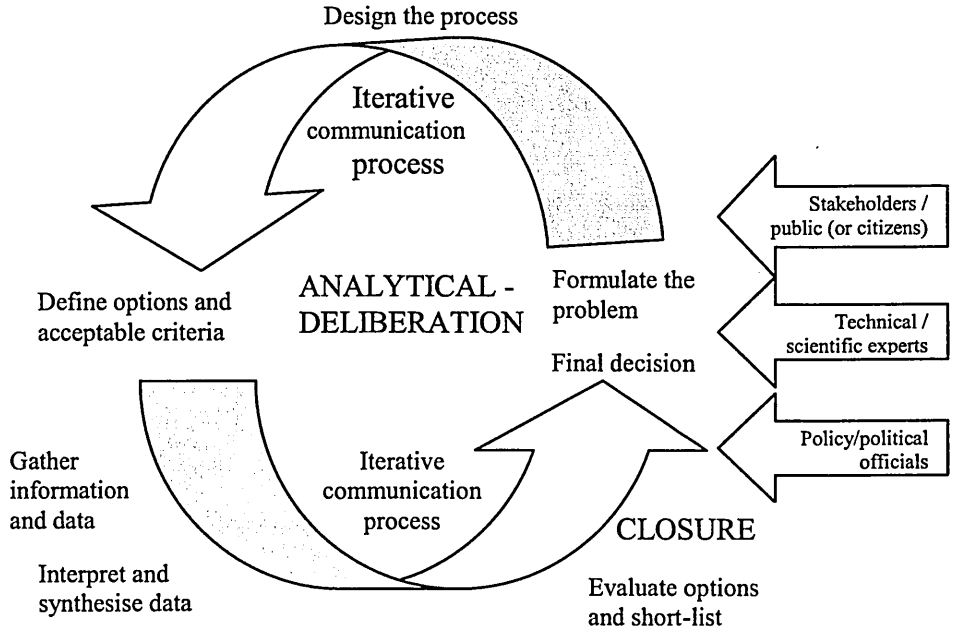
The emphasis on analytical-deliberative structures in European (e.g. European Commission 2001), UK (e.g. HM Treasury 2004; House of Lords 2000; RCEP 1998) and North American (e.g. Stern and Fineberg 1996) risk policy arenas has been instrumental in encouraging the public to take greater part in risk decision-making (Renn 1999). Analytical-deliberation creates opportunities to filter viable policy outcomes on two grounds (Alario 2000; 1998; Stern and Fineberg 1996):

- ***the analytical phase***, where the remit of experts (usually in a regulatory capacity) is to reduce the multitude of risks inherent in decision-making and address the uncertainty of policy outcomes. This may also extend to collaboration among scientists and citizens in defining the risk and identifying criteria for assessing solutions

- ***the deliberative phase***, which includes formal and informal processes of communication for raising and collectively considering issues to safeguard the process from setting priorities and goals on solely political or economic grounds

Concepts of the analytical-deliberative process in the US (e.g. Charnley 2000; Stern and Fineberg 1996; Holtzman 1989) and the UK (e.g. Chilvers 2007; RCEP 1998) can be broadly structured in a series of steps associated with risk decision-making (Figure 3.2). This starts at problem formulation and leads up to a course of action (i.e. final decision). Although post-decision elements such as implementation, monitoring and evaluation, are relevant in considering the decision process, the focus here is on elements inherent in decision-making.

Figure 3.2: Integrating analysis and deliberation into a series of steps for risk decision-making.



Source: After Chilvers (2000), Stern and Fineberg (1996) and Holtzman (1989)

As Figure 3.2 shows, analysis is integrated with relevant knowledge/values where appropriate through deliberation and synthesis which brings together technical/scientific experts, policy officials, stakeholders and the general public in debates around the best course of action, deepens understanding and uncovers new knowledge that feeds into, and progresses, processes for risk decision-making. The steps of the process are summarised sequentially, although some steps (e.g. problem formation and process design) may occur simultaneously with a great deal of exchange and iteration among each stage (Webler and Tuler 1999). The steps for problem formulation right through to the final decision are iterative, however, closure is required for each step and that means a decision move on to the next stage is mandatory, even if it means revisiting the previous stage at some point (Stern and Fineberg 1996).

- ***Formulate the problem:*** includes deliberation among the range of stakeholders to define the issues. The problem definition is revisited (and revised) as necessary throughout the process, but as the steps progress towards the final decision, the problem is revisited less frequently (Webler and Tuler 1999). Stern and Fineberg (1996) suggest the aim in formulating the problem is not necessarily to find consensus on one way of viewing the risks but, through deliberative methods, to agree a set of criteria for an acceptable solution.

- ***Design the process:*** there are two main objectives here – the first is to clarify the objectives which necessitate deciding who should participate, the relevant interest and values they bring to the table and what roles they play in the process. The second involves deciding how analysis will be used to inform and complement deliberations and how deliberations, in turn, will be used to frame and interpret analysis. Deciding how procedural rules and administrative systems can be changed to facilitate an analytical-deliberative process is also necessary. An important goal is to develop procedures that are acceptable to the range of stakeholders as obtaining agreement on a decision process can significantly affect acceptability of the outcome (Stern and Fineberg 1996; Crowfoot and Wollendeck 1990).

- ***Define options and acceptable criteria:*** analysis and deliberation can also work well together to generate options when the problem is well defined. For example, a wide selection of options may be available but analysis can reduce the options by use of 'exclusionary criteria' that might be legal or physical in nature. Deliberative groups, such as advisory committees and citizen panels, can help to develop exclusionary factors that are not, for example, evident from a legal standpoint or from technical analysis. Deliberation amongst interested and affected parties allows for the consideration of diverse, sometimes competing, decision criteria, many of which are associated with different interests, values and principles (Stern and Fineberg 1996).

- ***Gather information and data:*** judgements are made when gathering and interpreting information, usually from the best available knowledge – i.e. policy officials, experts, stakeholders and the public (Webler and Tuler 1999). Stern and Fineberg (1996) suggest deliberation is an important factor as it can frame and interpret analysis by raising questions, suggesting alternative ways to interpret or frame issues, generate hypotheses or provide data as input to analysing a risk situation. Additionally, stakeholders and the public may provide essential information about what must be analysed if the risk characterisation is to meet their needs for understanding.

- ***Interpret and synthesise data:*** this is important for summarising the relevant knowledge about the issue. Usually information is interpreted in the context policy options, explaining uncertainties and assumptions to a wide range of stakeholders. Webler and Tuler (1999) suggest more than one method ought to be used to summarise both qualitative and quantitative data so as to facilitate wide understanding of the issue and also to ensure the preferences of stakeholders are considered in the evaluation of options.

- ***Closure:*** achieving closure is important for moving from one step to another, even if revisiting a previous one remains a possibility. Stern and Fineberg (1996) suggest that the organisation facilitating the process ought to create mechanisms to promote closure and to set and enforce criteria/rules for

closure - Webler and Tuler (1999) recommend such mechanisms and rules be debated by the participants and verified before they are adopted. Some flexibility in closing discussions is necessary to allow all stakeholders a fair chance to hear others and be heard, and to bring forward additional information, concerns, and perspectives (Stern and Fineberg 1996).

Some authors suggest there are questions about the extent and form of learning achievable during deliberation and analysis – i.e. whether individuals acquire new skills, information and knowledge or whether different groups can cooperate with others in solving collective problems (e.g. Bull *et al.* 2008) and finally, questions regarding the extent to which actors and institutions learn about and learn from public engagement and dialogue (Chilvers 2009). While it is recognised that engagement processes enhance learning (e.g. Petts 2008), there are questions regarding whether a more participatory decision (or policy) process encourages people to see beyond their own agenda and pursue a collective one of 'responsible citizenship' (Bull *et al.* 2008). Benneworth (2009) suggests participants in both science and the public progress along a co-learning journey as both acquire knowledge, competence and skills in engagement. He said the level of interaction and knowledge exchanged builds 'learning communities of practice' which produce concrete engagement outcomes as well as initiate new members and develop existing members of the community. The question however is the level to which these learning communities influence science and policy, away from the pressures of urgency, conflict and crisis, where consultation and engagement usually occurs.

3.4: Typologies of public involvement

The emphasis on deliberation in decision-making has revealed questions regarding the level of public involvement, the degree of power sharing between authorities, experts and citizens, the relationship between traditional representative institutions and new deliberative processes, and the importance of 'context' in designing appropriate engagement strategies (Bull *et al.* 2010; Benneworth 2009; Chilvers 2009; Petts 2008; Bull *et al.* 2008; Chilvers 2007; Petts 2004; Burgess *et al.* 2004; Tuler and Webler 1999; Stern and Fineberg 1996; Cohen 1989). There are many competing typologies for public involvement that show divergent models of the role of ordinary citizens in decision-making. The most influential typology is the

'continuum' model which shows various forms of public involvement that devolves power over decision-making to different degrees. Arnstein's ladder of participation (1969) (Table 3.7) has been used for decades to describe public involvement as a multi-level hierarchal process (Tulloch and Sharpio 2003).

Table 3.7: Arnsteins's ladder of participation

Multi-level hierarchal process for involvement	Level of citizen power
Citizen Control	Citizen power
Delegated Power	
Partnership	
Placation	Tokenism
Consulting	
Informing	
Therapy	Non-participation
Manipulation	

Source: Arnstein (1969)

The ladder includes eight stages, starting with manipulation and therapy which she considers the non-participatory stages. The real objective here is not to encourage participation in planning and developing policies but to enable the decision makers to change citizens 'uneducated presumptions' (Arnstein 1969). In this regard, information and consultation are sometimes preferred as the total extent of public involvement.

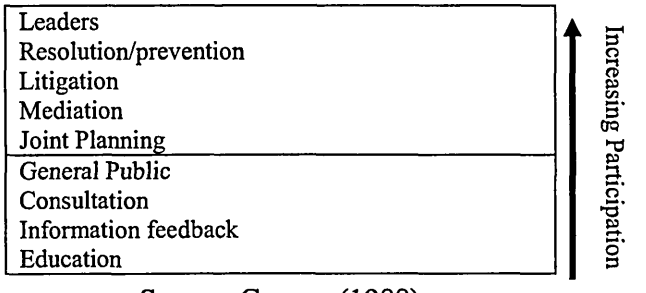
Although citizens may be given a forum to air their views, they generally lack the power to ensure that their views will be heeded by decision makers. Arnstein argues that consultative processes encourage decisions to be made from a small group balancing demands, rather than through the construction of consensus in the community at large. This is typically the case in open public hearings dominated by 'disgruntled' activist groups who air their grievances and in doing so control the forum and override the views of a larger audience who may well have more relevant issues. When public involvement is restricted to these levels, there is no assurance of change. Other consultation methods, such as the use of questionnaires or surveys, tend to avoid such conflicts but limit the contact and dialogue with the public. Booth and Richardson (2001) support Arnstein's position and suggest the public is not given any real say in consultative processes, and decision-making is left entirely in the hands of the relevant authorities. Placation is a higher level of tokenism where

citizens are allowed to provide advice but decision makers retain the right to make the final decision.

Further up the ladder are levels of power with increasing degrees of influence for citizens in the decision-making process. Citizens can enter into a partnership which enables them to negotiate and engage in trade-offs with decision makers - sharing the responsibility for planning and decision-making. At the higher end of the ladder, citizens are delegated power where negotiations with public officials may result in citizens achieving dominant decision-making authority over a particular plan or programme. At the top of the ladder is citizen control, which although does not imply 'full control', provides citizens with a certain degree of power that guarantees some control over a particular programme or institution, allows full charge of policy or managerial aspects, and permits them to negotiate the conditions under which decision makers may introduce change (Arnstein 1969).

Arnstein's ladder analogy has been applied and further developed by several authors (e.g. Chanan 1997; Thomas 1993; Weidemann and Fermers 1993; Connor 1988). Connor, in his New Ladder of Citizen Participation, framed public participation in terms of "preventing and resolving public controversy" (1988, p. 250). He suggests there are a range of public participation techniques to be used for dispute resolution, ranging from those that educate the public to more preventative techniques that reduce the potential for conflict (Figure 3.3).

Figure 3.3: Connor's new ladder of citizen participation



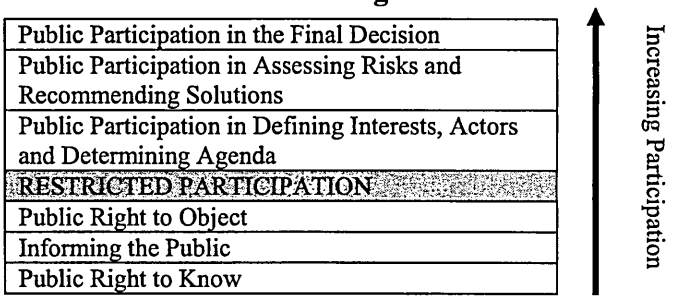
Source: Connor (1988)

Schlossberg and Shuford (2005) suggest that the inclusion of stages such as consultation, mediation, and litigation implies that decision-making is inherently confrontational and that there are various participatory methods that the public can

use to resolve disputes. Connor recognises that the nature of public participation can change over time within a single decision-making process. He suggests that certain public participation processes may be necessary at the beginning of a process (e.g. where the objective is to educate the public or evaluate their attitude or opinions), while other public participation methods may be more appropriate towards the final stages (e.g. where the objective is to gain public acceptance of a proposal or plan).

Weidemann and Fermers (1993) classified public involvement in terms of citizens rights, adapting it to their analysis of decisions needed for the purpose of hazardous waste management (Figure 3.4). According to their research, public participation increases with the level of access to information as well as the rights that citizens have in the decision-making process. They suggest public involvement in environmental decision-making tends to be limited to 'restricted participation'. The ability to define interest, identify the actors, determine the agenda, assess risks, recommend solutions and take part in the final decision has not been open to the public.

Figure 3.4: Public's rights and access to information in environmental decision-making



Source: Weidemann and Fermers (1993)

Several authors in the public involvement literature suggests the fundamental question from the perspective of any practitioner is how much participation is required for a decision to actually count (e.g. Petts 2008; Chilvers 2007; Creighton 2005; Burgess *et al.* 2004; Stern and Fineberg 1996). Ostrom suggests institutional rules for negotiating what level of participation is necessary for a decision to have legitimacy. She suggests that decision processes can be run on the basis of explicit (statutory) or implicit (informal) rules about 'who to involve' in each stage of the

process and on 'what basis they should be involved' (Ostrom *et al.* 1993; Ostrom 1990; Ostrom 1986). The rules suggest conditions in which practitioners may be able to assess the level of public involvement achieved in decision-making (Table 3.8) and include the following criteria:

- who has the authority to put forward proposals in relation to the nature and context of the decision (authority)
- the degree to which citizens have free access to information and are assisted in obtaining and processing that information (information and interaction)
- the level to which ordinary citizens are allowed to participate in decision-making (boundary); and
- the mechanism used to assess the validity of decision reached (aggregation)

Table 3.8: Levels of public involvement

Rules	No involvement	Intermediate level involvement	High involvement
Authority – the relevant body with the authority to put forward proposals, design of the process and the government level where decisions are made	- citizens do not have the authority to put forward proposals - citizens cannot decide on details and cannot decide on policy - the decision is made at the central level	- citizens and other parties have the authority to put forward proposals - citizens can decide on details but not on policy - the decision is made at the local level with intervention from the central level	- citizens are the only ones who can put forward proposals - citizens can decide on details and can decided on policy - the decision is made at the local level
Information and interaction - citizens' access to free information and the level of assistance provided to obtain information necessary for making decisions	- citizens receive no information and receive no support in collecting it - scientific information is the only information relevant to the decision	- citizens receive information from the authorities and/or private sector but are not supported in processing it - scientific information and local information is relevant to the decision	- citizens receive information and are supported in collecting their own information - local information is the only information relevant to the decision
Boundary – who should participate (i.e. who is included or excluded from the process)	- ordinary citizens have no access to the decision-making process	- Affected ordinary citizens have access to the decision-making process	- All citizens have access to the decision-making process
Aggregation – this prescribes which mechanism is used to determine validity of decisions made	- the decision is to based on judgements of the greatest good for the greatest number by expert-consensus	- the decision must be based on deals between interested and affected parties and/or their representatives who make judgements of the various interests involved	- the decision is to be based on consensus resulting from dialogue in the community

Source: After Ostrom *et al.* (1993)

The different approaches to public involvement are extensive, but what unites each typology listed is a philosophy that implies ordinary people should be involved in decision processes, that they offer relevant information, contribute to problem solving and help develop more practical and acceptable solutions (Stern and Fineberg 1996). Arnstein's ladder of participation starts from the perspective of individuals aspiring to participate, indicating a hierarchical structure for public involvement based on devolving power from decision makers to ordinary citizens. Similar versions (e.g. Weidemann and Fermers 1993) suggest public involvement increases with the level of access to information as well as the rights that citizens have in the decision-making process.

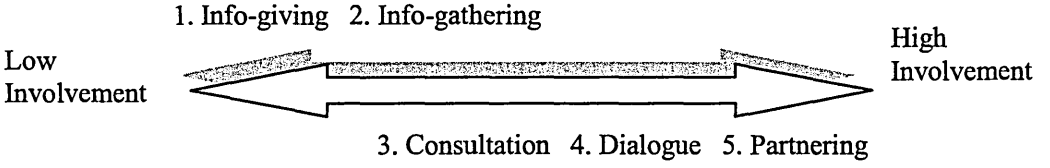
Other models (e.g. Connor 1988) suggest a framework for selecting appropriate methods for public involvement ranging from those that educate the public to more collaborative forms of engagement, where decision makers and citizens work in partnership. The last model presented is Ostrom's which describes conditions in which practitioners may be able to assess the level of public involvement achieved in decision-making. The importance of such rules (and other typologies for public involvement) is the development of a theoretical perspective that enables judgement on 'what approach works best in what situation' (Rowe and Frewer 2004), necessitating a review of both traditional and non-traditional approaches to public involvement.

3.4.1: A review of the approach to public involvement

Existing guidance on public involvement in waste planning - e.g. the Wales Partnership Consultation Tool Kit suggests it is important the public is assured that engagement is not simply a 'tick-box exercise', where the decision is already made. Rather, public involvement ought to include meaningful engagement, where ideas and concepts are deliberated in attempt to achieve consensus on the goals and actions to take (Hyder Consulting 2007). Dialogue by Design (2008) and the Environment Council (2007) suggests four main categories of public involvement in any environmental decision-making context that reflect differing roles for citizens, moving from lower to higher levels of participation. A potential fifth category is added, which is based on establishing 'communicative partnerships' between experts (or policy makers) and citizens - i.e. as proposed by Stern and Fineberg (1996) in

their discussion of the 'analytical-deliberative' process, and alluded to in Defra (2005g) guidance on the use of non-traditional approaches for involving the public in waste strategy development (see Chapter 2).

Figure 3.5: Approaches to public involvement



Source: based on Environment Council (2007); Defra (2005b); Stern and Fineberg (1996)

These approaches (Figure 3.5) are consistent with varying degrees of movement towards direct democracy implicit in the continuum model. The general aims and principles of these approaches are summarised in Table 3.9.

Table 3.9: Approaches to public involvement

Approach	Description	Aim	Typical methods
Information giving	Providing the public with balanced an objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions. It is a one-way flow of information.	To ensure that those who want or need it are in receipt of information.	Letter / leaflets / fact sheets / brochures (traditional) Exhibition / display / stall / road show Open meeting Door stepping Internet (e-mail shots, websites) Media story / advertisement (TV, radio, newspaper)
Information gathering	Using survey methods to gather information	To generate information to inform the decision-making process	Opinion survey (postal, telephone, face-to-face survey) Public meetings One-to-one meeting with selected stakeholders Focus Groups
Consultation	Giving people the opportunity to consider and respond to proposals, issues and options that have been developed.	To generate clearer understanding of people's concerns and opinions.	Consultation document Electronic consultation Citizen advisory committee Citizen's panels Appreciative inquiry Democs 'deliberative meetings of citizens' Deliberative polling

Table 3.9 (continued): Approaches to public involvement

Approach	Description	Aim	Typical methods
Dialogue (or Involving - see chapter 2.5.3)	Working directly with the stakeholders throughout the process to ensure that their concerns and aspirations are consistently understood and considered. It is two-way flow of information.	To create opportunities to build shared understanding and agreement (or to get a better understanding of disagreement)	Citizen's jury Open space meeting Consensus conferences Scenario workshop / citizen foresight Participatory appraisal Planning for real
Partnering	Establishes 'genuine' collaboration between public representatives, technical experts and decision makers. Involves including stakeholders early in the process and independent facilitation of combines processes of deliberation and analysis	The aim is to resolve conflict over evidence, interpret expert knowledge, understand and explore opposing perspectives, solve problems and find common ground	Deliberative fora, Collaborative project committees, Consensus building and conflict resolution committees Alternative dispute resolution (e.g. regulatory negotiation)

Source: Dialogue by Design (2008); Environment Council (2007); Hyder Consulting (2007); Defra (2005b); Stern and Fineberg (1996).

The guidance on public engagement is not prescriptive but offers suggestions on how to inform, consult, involve and establish partnerships with communities and stakeholders in delivering effective environmental policies (or plans). Nevertheless designing effective public engagement programmes is not straightforward and requires careful consideration of the decision context, the history and culture of involvement and process requirements (e.g. time and other resources). Engagement activities must demonstrate how public input, solicited throughout the programme, is an integral part of selecting the appropriate policy or solutions to environmental problems (Hyder Consulting 2007). Dorfman *et al.* 2010 suggest engagement activities need to be timely with an explicit connection to the decision process so that there is 'real' impact on policy or solutions. It is generally suggested that public involvement approaches need to match the purpose of engagement and a combination of several methods, either overlapping or in sequence, is likely to lead to success (Dialogue by Design 2008; Bovaird and Downe 2008; Environmental Council 2007). These ought to include both traditional methods that provide people with information and more innovative methods that establish continuous dialogue and partnerships between policy makers, experts and citizens. However, this often leads to questions about the success of combining different approaches, necessitating evaluation of the participation process and possible outcomes of public involvement.

3.4.2: Evaluation of public involvement processes

There have been many evaluative studies, and proposed frameworks, that measure the success of participatory and deliberative methods (e.g. Dialogue by Design 2008; Bull *et al.* 2008; Petts 2008; Rowe and Frewer 2004; Rowe *et al.* 2004; Beierle and Cayford 2002; Frewer *et al.* 2001; Bickerstaff and Walker 2001; Barnes 1999; Joss 1998; Petts 1995; Renn *et al.* 1995; Houghton 1988; Crosby *et al.* 1986; Rosener 1982). However, interpreting success is problematic because of the diversity of perspectives about the goals (and rationale) for public involvement.

Two distinct objectives have emerged from the literature which guides the evaluation of public involvement initiatives. First are *process objectives* that measure the extent to which the procedural aspects of a public involvement process are legitimate, reasonable, and responsive and fair (Pratchett 1999; Crosby 1995). Weber (1995) built on Habermas's (1984) notion of ideal speech situation to identify 'fairness' and 'competence' as two key criteria for evaluating the effectiveness of participatory and deliberative processes. There has been widespread use and adaptation of the fairness and competence principles in various evaluation studies, particularly those in the health sector (Beierle and Cayford 2002; Petts 2001; Rowe and Frewer 2000; Pratchett 1999; Crosby 1995).

- *Fairness* is most concerned with the extent to which an equitable process is created. This goal requires an equal distribution of opportunities to act meaningfully in all aspects of the participation process (i.e. setting the agenda, establishing procedural rules, selecting information and expertise to inform the process and assessing the validity of claims). Webler and Tuler (1995) suggest that four necessary opportunities for action by individual participants which must be available in order for it to be considered fair. They are to: (1) attend (be a participant in the process), (2) initiate discourse (make statements), (3) participate in the discussion (ask for clarification, challenge, answer, and argue) and, (4) participate in decision-making (resolve disagreements and bring about closure to debates)

- *Competence* is most concerned with the extent to which mutual understanding between participants can be achieved. A competent process ensures that appropriate knowledge and understanding of the issue is achieved. Webler and Tuler (1995) suggest this requires (1) access to information and its interpretations, and (2) use of the best available procedure to select the knowledge that will be considered in the process.

Second are *outcome objectives* that measure the outputs of participatory activities. Many discussions concerning outcomes note the distinction between participatory initiatives that use citizens to gather support for a particular site-specific issue and those that involve citizens while developing policy (Petts 1999; Chess and Purcell 1999; Renn *et al.* 1995; Fiorino 1990). Normally the 'outcome' of participatory processes refers to its substantive decisions, conclusions or recommendations – such as whether a waste facility should be built, what environmental issues should be prioritised.

Substantive outcomes can be evaluated (and compared with comparable non-participatory decision processes) using a variety of criteria such as stakeholder satisfaction with the outcome, cost-effectiveness, or risk minimisation (Beierle 1999). Stakeholder satisfaction has been identified as important for evaluating the quality of decisions (Stern and Fineberg 1996; Rosener 1983). Satisfaction is quite different from goals related to efficiency and effectiveness – it sees a decision-making process as successful if the actors involved are satisfied with the decision taken. This provides room not only for stakeholders' expectations but also for agencies' definitions that might be more tied to programmatic outcomes than theoretical definitions (De Bruijn and Ten Heuvelhof 2002; 1999; Jong 1999; Rosener 1983).

A more expansive interpretation of both process and outcome objectives include the extent to which a participatory or deliberative process achieves either: (a) best practice objectives or, (b) social goals (see Table 3.9).

Table 3.10: Goals for evaluating the success of participatory and deliberative processes

Best practice	**Definition of criteria (process and outcome)**
Representativeness	The process should comprise a broadly representative sample of the affected population, ensuring that barriers that bias representation are minimised
Independence	The process should be independent, reflecting consensus about recommendations and/or preferred decisions to be achieved
Early involvement	The participants should be involved as early as possible in the process, as soon as value judgements become salient or relevant
Transparency	The process should be transparent and open to those not directly involved but potentially affected; this ensures the relevant population can see what is going on and how decisions are being made
Task definition	The nature and scope of the participation task should be clearly defined
Structured decision-making	The participation exercise should use or provide appropriate mechanisms for structuring and displaying the decision-making; this allows participants to contribute to the agenda, and agree and influence the procedures and moderation method
Resources accessibility	Participants should have access to the appropriate resources, information and knowledge to enable them to successfully fulfill their brief, including critically assessing expert opinion
Cost-effectiveness	The process should in some sense be cost-effective from the point of view of the sponsors
Influence	The output of a procedure (and the contact group) should have a genuine impact on policy or proposal
Social goals	**Definition of criteria (outcome and process)**
Public values	Incorporating public values into decisions
Quality of decision	Improving the substantive quality of decisions – i.e. make a different to decisions and provides outcomes which are of public benefit
Social learning	Achieving instrumental or communicative learning that propagate knowledge amongst participants – e.g. allows for development of ideas, learning and new ways of looking at a problem
Conflict resolution	Reduce misunderstanding, allow discussion and examination of the authenticity of claims, and ensure dissent and differences are engaged and understood
Trust	Building trust in institutions, engage participants in dialogue to promote mutual understanding of values and concerns
Public education	Educating and informing the public

Source: Chilvers (2009); Petts (2008); Bull *et al.* (2008); Creighton (2005); Beierle and Cayford (2002); Snary (2002, 2001); Frewer *et al.* (2001); Petts and Leach (2000); Beierle (1999); Petts *et al.* (1996); Petts (1995).

There is almost universal acceptance of the presumed outcomes of public involvement initiatives with the social goals approach so the organisers do not necessarily have to spend a lot of time getting buy-in to those goals. The social goals approach is easiest to solicit support from upper management as it incorporates impacts resulting from the context in which the public involvement exercise occurs (Creighton 2005). However, the information obtained from an evaluation based on social goals would not necessarily identify exactly what changes are needed to make the public involvement process successful. Hence, if the primary reason for

conducting the evaluation is to identify improvements needed then an approach based on social goals may not be suitable.

Creighton (2005) suggests that public engagement practitioners should be pleased if the public involvement initiative met all the goals of best practice. However, he argues that not every criterion based on best practice applies to all deliberative and participatory methods. It is also possible for a method to meet all the goals of best practice but still be considered not successful – this usually has something to do with the context in which the method was used. Hence, it becomes necessary when evaluating the success of deliberative and participatory approaches to also consider the potential effects of other variables on the outcome of decisions: (a) simultaneous events (e.g. locations), (b) the social context in which the activities take place (the composition of the community and the history of controversy) and, (c) the nature of the environmental problem (Chess and Purcell 1999).

Petts (2006) suggests the relative characteristics of different participatory and deliberative processes need to be understood so as to select and adapt an approach to fit the immediate context and objectives of decision-making. Bull *et al.* (2010) reaffirmed the need to understand and respond to 'context' in the design and conduct of any engagement process. They make specific reference to the degree of political support for engagement and the extent to which a traditional bureaucratic, paternalistic approach to decision-making acts as a disincentive to more deliberative forms of engagement. Other practitioners in the field of public involvement raised the importance of space, place and time as key contextual factors shaping public engagement (Chilvers 2009). It can be concluded that the intensity of engagement will vary depending on context, where for example, more intense engagement is required in instances of poor political support or public scepticism around policy or technology. Additionally Benneworth (2009) suggests 'context' may change as engagement occurs so flexibility in collaborative relations is also important to ensure engagement remains meaningful for participants.

Woltjer (2000) summarised the positive and negative impacts of deliberative and participatory decision-making in relation to success of participatory process and the outcomes of decision-making (Table 3.10). The range of positive and negative

implications associated with deliberative and participatory initiatives are classified according to the process and outcome of decision-making. While the implications of deliberative and participatory decision-making are generic and based on theoretical principles of 'effective' public involvement; it is difficult for practitioners to determine, in advance, how successful a public involvement initiative is likely to be because of the large number of interested and affected parties that are likely to judge success differently.

Table 3.11: Impacts of deliberative and participatory processes

Decision-making process	Decision-making outcome
Positive	**Positive**
• representation of all significant interests • saving of money and time at later stages of the Decision-making process • improvement of public confidence in government • accurate information about affected participants • trust of citizens in the legitimacy of politicians and officials • match with desires for more democracy, openness, accountability and transparency • more influence and control over public behaviour • enlargement of public awareness and responsibility • construction of coalitions and partnerships as an anticipation of possible conflicts	• improvement of the quality of information needed • use of information from a wide variety of sources and experiences • inclusion of subjective perceptions of quality • more accurate information about the needs and desires of society • policy process appropriate to special circumstances and needs • strong foundation for sustainable decisions • good comprehension and knowledge about public opinion • high local and regional relevance of decisions
Negative	**Negative**
• decision-making with 'activists' and 'lobbyist' only, selective participation • decision-making with 'opponents' rather than 'proponents' • pursuing 'group interest' rather than 'public interest' • costly, lengthy and uncontrollable decision-making process • complex decision-making process due to a high number and variety of participants.	• emphasis on solutions determined for the short term, 'everyday routines' and individual interests • fragmented thinking in 'marketable' products • less attention to cohesion • less importance of professional expertise and technical knowledge • emphasis on conformism and compromise, leading to 'grey' solutions

Source: After Woltjer in OECD (2002)

Perhaps the most important characteristic of deliberative and participative decision-making is that the approach should be 'fit-for-purpose' (Burgess *et al.* 2007; Petts and Leach 2000). Primarily this involves a recognition that different decision situations and contexts will require different levels of public involvement, that are judged on a variety and combination of factors (e.g. the legitimacy, fairness and competence of the process as well as the substantive and quality outcomes, based on social goals). It is widely recognised by engagement practitioners (e.g. Chilvers 2009) that the nature

of the problem in question is crucial to designing the mode and level of deliberation and engagement. It can be concluded that greater clarity around the definition of who participates in decision-making, the rules of participation, and the expected influences and learning outcomes, improves the quality of engagement (Benneworth 2009).

3.4.3: Principles of good practice in public involvement

There is a body of shared 'good practice' that provides advice for designing and implementing effective public involvement initiatives (e.g. Environmental Council 2007; Arbter *et al.* 2007; Creighton 2005; Seargeant and Steele 1998; Downs 1997; LGMB1994; Wilcox 1994). These guidelines suggest key principles for designing and implementing more deliberative and participatory processes based on theoretical criteria for effective public involvement. Petts and Leach (2000) summarise these principles and suggest the following criteria for effective public involvement: (p.45)

- set clear objectives for participation
- identify and target all relevant stakeholders
- tailor the participation process to the objectives and the needs of stakeholders
- set out the process in an honest and understandable way
- ensure that participation is timely and allow sufficient time
- ensure the process is credible, interactive and generates a response, and
- only make commitments that you will be able to keep

Public involvement should be planned to ensure the criteria above are met. Seven planning steps are identified based on the Institute of Environmental Management and Assessment (2002) guidelines:

- consider the objectives of the public involvement exercise and issues that may arise
- consider the objectives of public involvement - both your own and those of potential participants
- consider the decision-making process in which the deliberative or participatory initiative is proposed and determine the time scale for public involvement

- identify potential stakeholders who will be relevant participants
- identify the need for staff training or external expertise
- consider how the results of public involvement will be analysed and used
- determine how the public involvement programme will be evaluated

These steps summarise practical principles for effective public involvement, underpinned by process and outcome objectives that are useful for evaluating the success of public involvement initiatives. They also establish key principles for using deliberative and participatory methods to effectively incorporate public values into risk decision-making - most of which may be adopted for analytical-deliberative processes.

3.5: Deliberative and participatory processes in practice

Much attention has been given to normative discussions of the merits of, and conceptual frameworks for, public involvement, but only limited attention to the need to evaluate the success of deliberative participatory and processes. This section focuses on practical efforts to design more informed, effective and legitimate public participation processes. The methodological successes and challenges in designing and implementing public engagement programmes for environmental planning are explored in subsequent sections. The discussion reflects on the characteristics of typical deliberative methods and case studies of analytical-deliberative processes to draw out areas of good practice as well as methodological challenges inherent in designing and implementing a more participative approach.

3.5.1: Deliberative methods

Overall, researchers have tended to conclude in favour of the use of deliberative methods (based on dialogue and partnering approaches) to support policy making in democratic governance. Much of the current emphasis on public involvement is also a response to the prevailing view that traditional methods, on their own, are no longer appropriate for current decision-making processes or for a more educated, sophisticated and less deferential public (Albeson *et al.* 2003; O'Hara 1998; Inglehart *et al.* 1996). The general aims and principles of examples of deliberative methods are summarised in Table 3.11. These are drawn from research and evaluative studies that

have assessed the effectiveness of deliberative methods used to integrate public values and concerns into decision-making.

Table 3.12: Advantages and disadvantages of deliberative methods

Method	Aim	Strengths	Limitations
Consensus conference: an externally organised forum that facilitates dialogue between experts and the public on a wide range of, usually controversial, issues	Provide citizens with the autonomy to frame problems in their own terms and select expertise and the information they feel relevant to the issue	Empower citizens, encouraging self-confidence, political awareness and knowledge of the issue. External advisory committee ensures procedures are transparent and open to scrutiny	Lacks institutional anchor so recommendation are non-binding. One-time events that do not usually sustain contact with citizens after the process
Community advisory committees (CAC): uses a wide range of techniques in which a small representative group of citizens debate, sometimes controversial, issues to find consensual grounds for decision-making	Makes public interests and values explicit, allowing different concerns and problem representations to be reconciled through group support	Builds a common base of information, relationships and promotes a mutual understanding of different concerns. Reveal consent, dissent and disagreement for productive and vital debates	Lacks institutional anchor so recommendation are non-binding. Participants selected from interest positions seen as relevant to decision makers which may presents issues of bias
Citizens' jury: a small group of citizens that are representative of the population are independently selected as jurors to learn about an issue, cross examine witnesses and make a recommendation	Citizens are provided with information and allowed to question experts, and then asked to express a preference among a given set of policy	Builds citizens understanding of policy to contribute to decision-making. Dissent and controversy are acknowledged and allowed means of expression	Lacks institutional anchor so recommendation are non-binding. There is usually limited time and information made available for deliberating complex issues – does not promote critical thinking

Source: Petts (2006); Hendriks (2005); Creighton (2005); Danish Board of Technology (2002); Joss and Belluci (2002); Wakeford (2002); Wakeford (2001); Petts and Leach (2000); Barnes (1999); Stern and Fineberg (1996); Crosby (1995)

Steele (2001) suggests some emerging practical uses of deliberative methods in environmental decision-making focus on citizens as valuable sources of knowledge and values, and associates participation with problem-solving. Steele establishes a 'regulatory case' for using deliberative methods, basing her suggestions on recommendations in the RCEP's report *Setting Environmental Standards* (Section 3.3.1). Overarching principles of public involvement, social learning and adaptive decision-making have emerged from research (Pimbert and Wakeford 2001; Renn 1999; Webler 1995) and the benefits of deliberation are summarised below:

- produce common understanding of the issues of the problem based on the joint learning experience of participants with respect to systematic and anecdotal knowledge.
- produce a common understanding of each group's position on the issues and assist in a mental reconstruction of each argument; striving for mutual understanding may allow participants to gain empathy for each other's situation.
- produce new options and novel solutions to problems. This process can create win-win solutions or identify moral grounds on which new solutions may grow.
- show and document the full scope of ambiguity with environmental problems. Deliberation clarifies the problem, makes people aware of framing effects, and determines the limits of what could be called reasonable within the plurality of interpretations.
- can also produce agreements. The minimal agreement may be a consensus about dissent. A deliberative process produces, at the end, several consistent and, in their own right, optimised positions that can be offered as package options to legal decision makers or the public.
- result in consensus. However, consensus is not a mandatory requirement of deliberation. The less stringent requirement of tolerated consensus is stipulated. In tolerated consensus some participants voluntarily accept personal or group-specific losses in exchange for providing benefits to general society.

There is the recognition that, while the goal is usually to reach a decision or at least positions upon which a decision can subsequently be taken, an unhurried, reflective and reasonably open-ended discussion is required. Nevertheless the desirability and feasibility of deliberative methods have been criticised on the grounds of public apathy (Carter and Darlow 1997), the in-built social disincentives to collective action (Pennington and Rydin 1999), their time consuming nature, and the impracticality of the approach where large numbers of people are involved. Lowndes *et al.* (1998) suggest that encouraging enhanced public involvement can emphasis differences within communities which may lead to greater parochialism and increase divisions

across the community. There is also a danger that deliberative processes will raise unrealistic expectations of what can be achieved within communities, leading to disillusionment with democracy (Pratchett 2000).

3.5.2: Analytical-deliberative processes

Analytical-deliberative processes adopt a range of deliberative methods to integrate technical information and stakeholder values into risk-based decision-making in environment, energy, health and local government fields. Their main purpose has been to provide a forum for 'non-expert citizens', acting as value consultants to combine technical facts with public values into a set of conclusions and recommendations (Abelson *et al.* 2003; Beierle 1999).

Stern and Fineberg (1996) suggested the analytical-deliberative process was first used in the USA on a number of environmental policy initiatives: e.g. to negotiate water quality rules, sludge disposal strategies, future land use for a former nuclear waste site and to determine the location for a hazardous waste incineration facility. Similarly, analytical-deliberative approaches have been adopted in Western Europe including the UK, where analytical-deliberative processes have been used successfully in the development of municipal waste management strategies (e.g. Petts 1995) and in the review of radioactive waste policy (e.g. Chilvers 2007).

A review of analytical-deliberative processes reveals the successes and challenges inherent in designing and implementing the approach in the context of waste and environmental planning. The five case studies selected, mainly on the basis of accessibility, demonstrate a range of methods adopted. In line with the research focus, the examples include waste management planning (UK and European) and water regulation (USA).

The case studies demonstrate the ongoing development of public involvement in the UK waste sector (West of England Waste Partnership 2009; Merseyside Waste Disposal Authority Community Engagement Programme 2008), and an example of successful consultation and engagement (Hampshire County Council's *Project Integra* 1993-94). They also include early examples of successful analytical-deliberative processes for public engagement in environmental planning (USA) and

waste management planning (Germany). Key features of the case studies, including the methods, purpose and rationale for engagement, and the process and outcomes of the public involvement programme are summarised below.

Case 1: Consensus-building in strategic waste management planning (EFW facilities, Hampshire, UK)

A voluntary public involvement programme was initiated by Hampshire County Council Waste Disposal Authority in 1993 to examine options for dealing with household waste and to seek wide public support for a local waste management strategy which could be translated into new facilities (Bulls *et al.* 2008; Petts 1995). The particular situation in Hampshire was controversial following the refusal of a planning application for a single large EFW incineration plant (capacity of 400,000 tonnes / annum) in 1991. The proposal was met with opposition from members of the local community (and ultimately from Portsmouth City Council - the host city within the County of Hampshire) (Petts 1995).

The public involvement programme included a community advisory committee (CAC), which followed the model of a consensus panel to generate rational discourse (Petts 1995). Three CACs, consisting of 16 - 20 participants, were formed in each of the areas of the three regional groupings for waste management within the County. Participants were solicited following a community analysis and appraisal exercise and included a mixture of people with different interests in waste such as community, environmental, business, health, conservation and parish (Petts 1995). The CACs provided the opportunity to debate a range of issues and to challenge and validate claims from both opponents and proponents. Each CAC was independently facilitated, providing participants with training and information including expert advice; field visits and formal consultation events (e.g. open days at waste facilities, public meetings, resource packs) (Petts 1995).

The remit of the CAC discussions were developed beforehand and provided a sounding board for the development of an integrated waste management strategy, identified the concerns, objectives and criteria people use to judge different waste management options and commented on the range of options for communicating information to the general public. The process encouraged debate and opportunities

to challenge and validate claims through small group and plenary discussions and has been deemed largely an effective deliberation process (Petts 2001) on the basis that it provided an ideal basis for learning (Bull *et al.* 2008). Recommendation from the CAC discussions included greater consideration of recycling, composting and anaerobic digestion and agreement on the need for EFW as part of an integrated waste strategy. The process resulted in an agreed waste strategy that included 3 small EFW facilities, delivered in 2005 following an extensive community engagement programme. Useful synergies were established by extending the CACs to form a core forum that provided advice during facility planning (Petts 2008).

Case 2: Community engagement in facility planning (MRF plant and integrated visitor centre proposal, Liverpool, UK)

Merseyside Waste Disposal Authority (MWDA) appointed a community relations company (PPS Consultants) to work with its in house Communications Team to advise and assist with the engagement event for a proposed materials recovery facility (MRF) and integrated visitor and education centre at Gillmoss. The public engagement programme, in line with PPS *Seven Point Plan*[17] consisted of a mixture of information giving and gathering methods, consultation as well as more innovative forms of engagement. The public engagement programme allowed residents, politicians and other stakeholders to comment on the proposals before the application was submitted. Information was provided and feedback gathered on the proposed facility using a number communication channels (e.g. newsletters, briefing packs, information days, presentations, drop-ins and field visits) (PPS 2008).

Participants in the engagement events and the general public raised a number of issues around the technologies and processes used for waste treatment, the site location and the potential for growth to accommodate more waste and possible environmental and economic impacts (PPS 2008). MWDA in the planning application addressed issues from local residents including: concerns relating to future development, job creation, potential noise, odour and dust creation, increased

[17] PPS Seven Point Plan was recommended to ODPM (now DCLG) as best practice in the area of community engagement. It allows applicants to demonstrate how they have met the demands of the Statement of Community Involvement, encourages constructive dialogue with stakeholders and demonstrates how that dialogue has influenced the application (PPS 2008).

traffic movements and other potential effects on the surrounding environment. Most of the enquiries made to the development team were of a supportive or inquisitive nature, with little or no formal opposition to the proposals (PPS 2008).

Case 3: Public involvement in regional waste management planning (Joint Waste Core Strategy, West of England, UK)

Councils in the West of England (Bath and North East Somerset, North Somerset, South Gloucestershire, and Bristol) worked together to produces a Joint Waste Core Strategy that set out policies to help planners make decisions about where waste facilities should be located. The West of England Partnership consulted on a Preferred Options Document (see definition in Chapter 2), which outlined the general principles and approaches to be developed in the Joint Waste Core Strategy, as well possible sites for large-scale waste facilities (Dialogue by Design 2009). The public involvement programme consisted of two stakeholder workshops ran in parallel with a formal consultation programme (e.g. neighbourhood meetings and drop-in sessions). These events brought together stakeholders with in-depth specialist and technical knowledge of the issues pertaining to the Joint Waste Strategy to debate the different options proposed and potential problems highlighted in the preferred options document. Issues pertaining to site allocation and the robustness of the process to develop the final strategy arose out of the workshops and formed the basis for further discussions at consultation meetings. Additional comments and feedback was solicited for a period after the formal consultation event and these were reviewed and considered separately (The West of England Partnership 2009).

One of the issues arising out of the consultation and stakeholder events included difficulties expressing opinions as technologies and sites had not been identified. There was some support for combined heat and power facilities to recover energy from waste but participants were concerned about the size of facilities needed to meet capacity needs. Recommendations included the need for additional site criteria and an alternative plan in case the desired option cannot be delivered (The West of England Partnership 2009).

Case 4: Regulatory negotiations for a disinfectant bi-product rule (DBP) (USA)

The EPA organised a regulatory negotiation rule-making process to develop a DBP rule in 1992. Regulatory negotiation is an alternative dispute resolution method in which representatives of formal stakeholder groups, work consensually with government regulatory bodies to draft a proposed rule. The goal is to reach a formal negotiated settlement and the approach has been frequently used in the USA to draft complex and highly technical rules, especially when there is a clear need for a rule but insufficient data to support the customary EPA rule making process (Stern and Fineberg 1996). The negotiation approach was deemed suitable on the basis that: 1) the problem was clearly defined and provided a factual basis for discussions, 2) the number of interest position on the issue were relatively small, 3) there was a strong degree of 'good faith interest' in resolving issues, and 4) the agency was willing to committee the necessary resources (Stern and Fineberg 1996; p.181).

An independent consultant was employed to run the negotiation committee that comprised of 17 participants from key interest groups. Deliberations were informed by a technical working group and independent health experts, solicited by the committee to provide additional information on health-related risks. Negotiations allowed participants to contribute to option analysis, however, recommendations were restricted in line with existing legislation (e.g. the Safe Drinking Water Act which requires that contaminants be regulated with maximum concentration levels). There was ongoing interaction and a constant exchange of information between the negotiation committee and the technical working group that sometimes helped to resolve misunderstandings and disagreement among committee members (Stern and Fineberg 1996).

The committee closed negotiations by agreeing to three rules which resolved residual disagreements and issues of uncertainties. The rules addressed issues of regulation directly and made allowances for cost effective implementation, where regulation could be phased in over time. For example, the Information Collection Rule provided a breakthrough compromise that made the proposed DBP rule politically feasible. It was decided that data collected under this rule would be used to inform the final adjustments of the provisional rules and the need for and content of long-term rules. An agenda for reviewing and finalising provisional rules was set and provisions

made to encourage committee members to return for subsequent negotiations (Stern and Fineberg 1996).

Case 5: Regional waste management strategy (Germany)

The Centre of Technology Assessment conducted a review of the regional waste management strategy in Southern Germany (1994-1996). The public engagement event involved a scenario workshop (combination of 16 consensus conferences and 10 citizen panels) that aimed to enhance the competence of participants in decision making and, assign a fair share of the responsibility of managing risks to those who are or would be affected by potential consequences (Renn 1999). The remit of the group was to develop regional waste reduction policies, assess the recycling potential of the area and find the most suitable technical solutions for waste processing before final disposal. The particular situation was highly controversial - there were controversies about health impacts, long-term consequences, institutional trust, and economic disadvantages associated with waste treatment sites. Risk perceptions and issues regarding fairness were the driving force behind the debate (Schneider and Renn 1999).

Three distinct phases of participation were organised and each had a specific task involving the range of stakeholders who were especially legitimised to decide on the problem. The first involved the identification and selection of concerns and evaluative criteria where representative stakeholder groups were asked to reveal their values and criteria for judging different options (Schneider and Renn 1999). The second step involved different experts evaluating the options at a series of consensus conferences (Renn 1999). The final stage included a random selection of 200 citizens from potential host communities that worked in panels to select criteria and identify sites from pre-selected locations. Citizen deliberations were informed by presentations from the stakeholder group and a standard programme of information and field visits. From the final decision, one central incinerator and two mechanical-biological treatment plants were to be located in the region. However, a subsequent decision was made to follow a different technological treatment method and to dissolve regional cooperation in order for the counties and city to seek individual solutions for their waste problem (Schneider and Renn, 1999).

Review of case studies

The case study review draws on previous evaluative studies that assess the effectiveness of analytical-deliberative processes (e.g. Bull *et al.* 2010; Bull *et al.* 2008; Petts 2008, 2001, 1997; Rauschmayer and Wittmer 2006; McDaniels *et al.* 1999; Apostolakis and Pickett 1998; Stern and Fineberg 1996; Renn *et al.* 1995). These sources justify a focus on the design of the process and the conditions under which analysis and deliberation preceded, and also how the process was facilitated and how those involved communicated and interacted with each other to arrive at conclusions. An analysis was carried out focusing on: a) the nature of the problem, b) means of engagement, c) problem framing and agenda setting, d) representation and inclusion of participants, e) information provision, option evaluation and expert-citizen deliberations, and f) closure and decision impact. The key points drawn from the case studies are summarised below.

Nature of the problem. One of the most significant challenges of risk decision-making is designing an approach that is effective, efficient and appropriate for the specific risk and the social and institutional conditions surrounding the risk decision. The case studies suggest it is highly likely a risk decision will require extensive deliberation, integrated with analysis if the issues are social in nature and more broadly defined, or if there is much disagreement about potential impacts of the technology (or policy) under consideration. Less intensive forms of engagement may be pursued if the interests are narrowly defined and there are common views regarding the likely impacts from the technology or policy.

Means of engagement. Formal consultation or restricted forms of dialogue (information gathering, information collection and formal consultation) may be adopted in situations that appear to be less controversial. In such cases the aim of engagement is usually to align public values and preferences closer to those represented within the decision process. This is not to say, however, that formal consultation has no part to play in highly inclusive public involvement programmes. UK examples demonstrate the success of running formal consultation activities alongside more innovative processes such as citizen advisory panels and stakeholder workshops early in the decision process. While this approach could be deemed more resource intensive, the combination of methods offered benefits such as the ability to

solicit wider public views and concerns to develop stronger (i.e. more quantifiable) bases for assumptions of consensus.

Combining deliberative methods with traditional forms of engagement can be a vital part of a public involvement programme, particularly in emotionally charged or controversial situations where there is a clear need to resolve conflicts and promote social learning and trust in order to arrive at effective and agreeable or acceptable solutions. However, the level of inclusion varies depending on factors such as the nature of the technology, culture, values and history of the area, urgency of decision-making, availability of expertise and resources for public engagement.

The disadvantage of substituting one form of engagement for another (i.e. intensive group deliberations for formal consultation) is that it restricts the ability to assess how widely the views and concerns expressed in small group discussions are felt in the wider community, increasing the likelihood of objections to the final proposal. In addition, decision makers need to be 'democratic' in their approach to policy, so open access consultation naturally becomes an important part of any public involvement programme.

Framing the problem and setting the agenda. Several parallels can be drawn from the case studies to suggest there are different approaches to framing the problem and setting the agenda. A more collaborative approach to problem framing (e.g. engagement in problem definition, criteria development and option evaluation) ensures the process addresses a wide range of issues (e.g. technical and social) and increases opportunities for citizens to have direct impact on decisions. Less collaborative approaches that limit participation to commenting on short-listed options or an already drafted proposal introduce boundaries for stakeholder input and constrain the development of innovative solutions.

Collaborative approaches to problem framing and agenda setting reflect a gradual movement to community co-production of solutions, where public buy-in is considered an inherent component of the approach. The success is dependent on the ability of practitioners to work with the regulatory regime rather than being constrained by it. This recognises that analytical approaches (used in isolation) are

insufficient for capturing the values and concerns of the community or public at large. Hence public involvement is considered more successful (i.e. open, transparent and fair) if local knowledge and experience is fed directly into the policy process, contributing to problem framing, development and evaluation of options.

Representation and inclusion of participants. Several parallels can be drawn from the case studies to suggest that the appropriate breadth of participation in analytical-deliberative processes depends on the decision situation. Key questions regarding the representativeness or inclusiveness of the engagement process include: a) how the involvement of a few residents (or members of the public) can be trusted to be representative of the wider population (or local community), and b) whether engagement of expertise is broad-based enough to cover the range of issues or interests pertinent to the problem situation.

The case studies reveal that a particular challenge is how to decide whether a particular party is likely to be affected by a decision. An emerging general rule is the inclusion of a wide range of interested and potentially affected parties, including those individuals or groups that appear not to be knowledgeable or interested in the issue. However, care and attention is needed to identify how much information, training and support is needed for individuals to understand the policy/technology context before contributing to decision-making.

The level of trust citizens have in the commitment and ability of experts and official stakeholders to protect them or act in their interest is an important consideration in assessing who to engage in the process (and at what stage their participation is solicited). On more controversial issues, or where there is potential mistrust of key parties (e.g. waste management contractor), engagement of diverse expertise and stakeholder views (including that of local politicians) is an important strategy for drawing out different interests and allowing for certain 'fixed positions' to be challenged.

The levels of trust change, so early decisions to limit participation may later prove detrimental to creating a legitimate process. Hence the context of the decision situation (including the history and culture of decision-making) must be thoroughly

assessed when deciding who to involve in the engagement process and how representative the sample needs to be.

Information provision, expert-citizen deliberations and option evaluation. A key challenge to implementing analytical-deliberative processes is finding effective ways of communicating new and often complex information to citizens. There is a need to obtain balance in the level of information and training provided for citizens to engage meaningfully with options and for them to develop their own perspectives on issues under discussion. However, the availability of resources and time restrictions can impact on the level of interaction and opportunities for discussion in most deliberative processes. So it could be argued that citizens with a greater remit in the engagement process would require higher levels of training, time and support to increase their capacity to contribute effectively to decision-making.

The level of expert-citizen interaction in public engagement events can affect how much individuals learn from the process and are empowered enough to contribute to decision-making. The case studies show that people become more confident and well informed throughout the process. An important issue raised in each case study was the need for independent and competent facilitation of discussions, where information can be converted and conveyed between scientific and lay participants to optimise learning.

Ongoing interaction and a constant exchange of information between experts and stakeholders are important for supporting learning (or in changing/influencing individual judgements). However, the culture of expertise, which often assumes a deficit model of lay knowledge and focuses on the efficiency of an evidence-driven process, was notable in some case studies. This was justified on the grounds that: a) the number of affected interest positions on the issue was relatively small, 2) there was a well developed factual basis for holding deliberations, and 3) there was a strong degree of 'good faith interests' in resolving the issue through negotiation. Nevertheless in most case studies the synthesis of knowledge about risks and uncertainty was not achieved through quantitative analysis alone but through the combination of analysis and deliberation. This was justified on the basis that there is

great uncertainty and limited technical knowledge (early on), particularly where issues are of a socio-technical nature.

Closure (and decision impact). Participants are likely to consider analytical-deliberative processes successful if they are satisfied with the final decision. A key objective of the process is to achieve sufficient closure to debates, where stakeholders can agree on recommendations or at least a position upon which a decision can be taken. However, the 'take-up' of the end-results or outputs from the process to a large extent depends on the level of institutional (and political) or legislative support given to the process.

The outcome of decisions and future actions of the decision-making body are elements that indicate how citizen deliberations influenced or impacted upon decision-making. Hence a key objective in closing debates and implementing the decision is to be clear about which recommendations (from expert and citizen deliberations) have been taken on board and which ones have not (and the reasons why, in both cases).

3.6: Conclusion

The literature has demonstrated a shifting culture towards more deliberative and participatory forms of public involvement in environmental decision-making. There are sound theoretical arguments and legislative support for greater public involvement specifically to enhance policy outcomes. The 'crisis of confidence' in science policy (House of Lords 2002) and the need to foster constructive, communicative partnerships between science and society (POST 2009) have been the reasons why extended public involvement through an analytical-deliberative process (Stern and Fineberg 1996) has been promoted and put into practice.

However, the best means to integrate deliberation with conventional technical elements within existing decision structures remains a significant issue (e.g. Chilvers 2007; Levidov 1999). UK and international experience of analytical-deliberative processes suggests that the terms for wider engagement in practice and a deeper understanding of factors influencing effective implementation are context-specific

and require investigation. Research also points to the need for a better understanding and response to contextual or process factors that make participatory or deliberative approaches desirable (Bull *et al.* 2010; Benneworth 2009). In this regard, there is a need to examine the suitability of combining deliberative approaches to the risk decision situation and context, its integration with relevant analytical systems/tools and the potential to negotiate the level and mode of participation within existing institutional regimes (including constraints such as time and resources, information requirements and others).

The potential for enhancing public involvement in siting processes and in discussions regarding the need for municipal waste facilities has been advocated at the level of central government. Waste management policy as the outcome of analytical-deliberation is not only a normative claim but finds empirical support in the radical change in UK waste management policy from a focus on environmental protection during the 1970s to a more integrated approach from the 1990s onwards (see Chapter 2). This is in line with the 'Modernising Local Government' agenda which encourages local authorities to actively engage stakeholders and communities from early stages and throughout the entire process of developing municipal strategies and facility plans. It is further emphasised by the National Waste Management Strategy 2007, which aimed to integrate a social dimension into processes for decision-making, planning and problem solving (through early public involvement) to reflect the concerns and interest of communities in the development of waste strategies and plans.

The 2010 *Localism Bill* envisages an even greater role for the public in deciding what waste management facilities are adopted and what benefits the host community is likely to accrue. This conveys a strong expectation that local authorities will pursue more effective forms for engaging the public while recognising that different waste proposals will require different forms of engagement (e.g. information, consultation, involving and partnering approaches). For instance, in uncertain and ambiguous situations, where public perception of impacts and other social issues are the main factors, then the use of scientific tools may prove less useful, so it becomes unclear what action would be appropriate and acceptable to a range of stakeholders. Thus situations of high uncertainty need to be properly explained and understood so

that it does not delay decision-making or cause the selection of values at the extreme of the ranges that result in highly risky (or overly conservative) action (Rose and Cowan 2003).

Petts (2003) suggests that local authorities are encouraged to try more innovative participatory and deliberative methods because of the degree of public opposition to waste facilities and the recognition that their traditional paternalistic approach to waste strategy development and facility planning exacerbates such problems. However, if analytical-deliberative processes are to be seen as legitimate (by both local authorities and the public), they will require institutional support either through legislation which makes new modes of engagement mandatory, or regulatory support which gives such processes institutional validity (anchor). Petts (2001) suggests the public ought to be involved in waste management decision-making through deliberation in an assessment process that informs and influences the decision outcome. Other advocates of analytical-deliberative processes (e.g. Charnley 2000; Schneider and Renn 1999; Stern and Fineberg 1996) argue for the public to play a greater role in the process because of the potential for improvements to risk characterization. For instance, the public has a part to play in identifying the agenda and the issues to be discussed; the data required and agreeing who should obtain the data; understanding the uncertainty; overseeing the assessment and engaging in decisions on risk prioritisation and acceptability (Petts 2004).

Experiences of applying analytical-deliberative processes to develop waste management strategies in the UK (e.g. Petts 1995) and site waste facilities in Germany (e.g. Schneider and Renn 1999) suggest engaging ordinary citizens in strategic and facility planning could gain the acceptance of stakeholders and reduce opposition to waste facilities. Petts (2004) suggests that if the public could be directly involved in the identification of criteria for site selection, in understanding the site selection process and in applying multi-criteria assessment methods to site identification, they could make effective contributions to consideration of trade-offs that have to be made.

Other research suggests analytical-deliberative processes can significantly enhance (1) the integration of social values into analytical decisions (Dialogue by Design

2008; Petts 2006; 2003; 1995; Schneider and Renn 1999; Stern and Fineberg 1996; Renn 1992), (2) public trust and confidence in decisions and decision makers (Bull *et al.* 2008; Petts 2008; 2004; Armour 1991), and (3) the quality of technical assessment processes through citizen interrogation and challenging of expert assumptions (Dialogue by Design 2008; Petts 2008; Yearly 2000; Funtowitz and Ravetz 1991). However, several barriers exist to implementing effective analytical-deliberative processes which involve a complex mix of technical, institutional, regulatory, social and cultural issues (Petts 2004) and demands a thorough understanding and response to 'context' (Bull *et al.* 2010, Benneworth 2009; Chilvers 2009). The assessment of processes and outcomes of public involvement initiatives (and the link between them) is also necessary if claims about process (in)effectiveness are to be verified, and practitioners are to gain a systematic understanding of the required nature, extent, and synthesis of analysis and deliberation in different decision contexts (Chilvers 2007).

The goal of this research is to establish stakeholders' opinions on the need for, and barriers to, integrating public values in technical analysis of options for municipal waste management, to inform judgement on how analytical-deliberative processes may be used successfully, given the nature of the waste problem and the social context in which public involvement initiatives may take place. Having established the theoretical context for the research, the next chapter develops and justifies the methodological approach to the research.

Chapter 4: Research Methodology and Methods

This chapter presents the philosophical assumptions underpinning the research approach, the connections between the methods, the theoretical framework and analytical approach. The overarching objective of the research was to generate a typology of variations in perceptions of waste issues by exploring how these are framed by industry experts, policy makers, and interested and affected citizens; and how the different values, ethics and judgements of groups underpin their opinions and attitudes to early public involvement. This required an examination of the relationship between 'expert' and 'citizen' groups with a particular focus on how trade-offs between different dimensions of performance or values of individuals are made in multi-criteria or multi-objective situations. Investigating the social conventions, politics and power and the prevailing culture of the decision situation required a 'mixed methods' approach to explore multiple perspectives of the problem and identify patterns and processes that could be linked to social and institutional structures.

4.1: Research approach

The underlying assumptions and goals of the research are based on principles of pragmatism, which is the most recent variant of the relativist position and presents the idea of 'critical realism' (Robson 2002; Easterby-Smith *et al.* 2001; Johnson and Duberley 2000). This idea has been presented as the way forward, acknowledging that positivism has been discredited but avoiding the divorce from science that is implied by the less methodical or systematic versions of relativism (Section 4.2). The implication is that knowledge is not considered absolute but treated as ongoing process in which the concepts used are improved to understand the phenomena being studied. The idea here is that truth is 'transcendental' and is primarily known in the context of peoples' perceptions (Krieglstein 2000; 1992). This is further reflected in Habermas's (1984) ideas around reasoning which introduces different forms of knowledge that can contribute to decision-making. One is explicit in the form of scientific knowledge, often justified on the grounds of technical rationality, while the other is implicit in the form of local or anecdotal knowledge, often justified on the

grounds of a moral/cultural and emotive-aesthetic rationality (Healey 1997; Webler 1995).

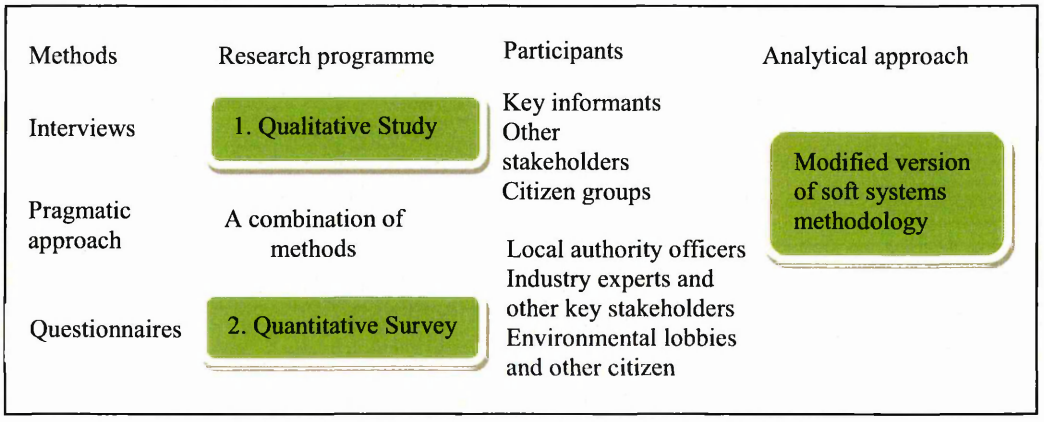
Quite often decision situations are constraining and demand conformity so that a dominant worldview is protected (e.g. realism). Any anarchic responses to that view are socially prevented from entering the arena of debate. As such the goal of the research is to understand and explain different views of the waste management problem and attitudes towards greater levels of public involvement, in order to identify areas for feasible and desirable change, and therefore create knowledge that can be used to "counteract irrational and repressive social structures and processes" (Mikkelsen 2005; p. 36). In this regard, the research is considered normative, as it seeks to produce knowledge that would bring about a positive change. The premise for success lies with the degree of 'fit or match' between the underlying theoretical predictions and the data collected. The presumption is that the decision maker is better able to function as a result of the theory plus the 'deeper insight' and 'greater confidence' obtained from witnessing many different views of the problem (Mitroff and Turoff 2002).

The theoretical framework presented in Chapter 3 was used as a basis to collect and organise data so as to interpret potential outcomes of a more deliberative and participatory approach to waste management decision-making. A 'mixed methods' approach (defined here as the collection and analysis of qualitative and quantitative data in the context of a single study) has been chosen for the research in order to establish connections with the empirical world and the theoretical content (Kelle 1991). There are three main elements to the approach:

- a qualitative study involving a series of 32 interviews with stakeholders across the waste sector and,
- a quantitative study including 60 questionnaires from stakeholders across the waste sector
- combination of qualitative and quantitative data to reveal illuminating insights into the issues and create a rational basis for discussion and recommendations

The first phase of the study uses a qualitative design that includes discussions with key informants, stakeholders, citizen groups and empirical data in order to explore waste management issues and opinions on early public involvement and to define the contexts where they are likely to operate and the characteristics of participants best targeted for the next phase. The second phase uses a quantitative design to confirm the relationships and views of participants, and statistical analysis to develop numerical descriptions that identify the more important factors for participants in an attempt to determine what opportunities and barriers exist in relation to a more participatory and adaptive decision process for waste management (see Figure 4.1).

Figure 4.1: A methodological structure for the research



The combination of findings from phase one and two forms the core component of the research. A modified version of 'soft systems methodology' (Checkland 1981), defined in Section 4.3, is used to interpret data to improve understanding of what changes in waste management decision-making are feasible and desirable to a wide range of stakeholders across the waste sector. The analytical approach takes a pragmatic view of soft systems methodology and introduces an appreciative setting in which alternative views (whether supported by science or based on local experience or judgement) can be put forward without fear of repression from 'conformity inducement'. The aim is to develop a communication setting which allows for the process of accommodation of different views to take place by nurturing the formation of an emergent view (Davies and Ledington 1991). This approach is particularly useful in situations where there are conflicts between scientific, social, cultural or ethical context of decisions. Typical examples include the selection of sites for waste management facilities, the adoption of genetically

modified food and embryonic stem cell research; where there are perceived health impacts, social, cultural and ethical issues.

In terms of data collection, qualitative and quantitative methods used together in the past, and in many cases the mixture of methods in one form or another has resulted in illuminating insights about the investigated problem (Kelle 2001). The presumption is that both quantitative and qualitative methods can contribute to our understanding of decision-making, but that their influences are not equal in understanding every issue in the decision process. For instance, qualitative approaches are useful for understanding the behavioural aspects of decision processes in terms of the underlying reasons and motivation of different stakeholders, which are usually relevant to problem specification, generating alternative courses of action, and decision implementation (i.e. consultation, monitoring and feedback).

Quantitative approaches measure the incidence of various views and opinions in a chosen sample using a variety of rigorous techniques to deal effectively with the challenge of evaluating and choosing among different views on the problem to select the most appropriate course of action. By drawing upon both qualitative and quantitative systems of inquiry, the research should include a more complete picture of waste management issues and a stronger foundation for analysing opinions of different stakeholders (Bryman 2006; Taylor 1984).

4.2: A pragmatic methodology

According to Mitroff and Turoff (2002), truth is 'synthetic' to the pragmatist and this means that the truth content of a system is not located in either its theoretical or its empirical components, but in both. While it is understood that multiple methods do not provide the solution for methodological problems inherent in both qualitative and quantitative designs, this approach is adopted for this study on the basis that similar patterns of findings from different methods of gathering data increases confidence in the validity of the findings (Creswell and Clark 2007).

It is clear that positivist and post-positivist traditions each 'stand on opposite ends of the line' and the idea of finding a 'middle ground' is a difficult one. The reason is that a positivist (i.e. realist) will always criticise the extreme relativist's concept of research which assumes that a researcher can approach an empirical study without any theoretical preconceptions whatsoever (Kelle 1991). Pragmatic approaches aim to represent the continual cycling back and forth between theorising and data production that is characteristic of the experience of many scientists, without abandoning the view that theorising can be influenced by systematically structured encounters with a real world that is in some sense beyond theory (i.e. cannot be interpreted from current knowledge) and outside language (i.e. assumes a theory-neutral observational language). The problem with the pragmatic approach is whether the epistemological and methodological concepts are sufficiently linked to theoretical considerations, or whether there 'ought' to be a link (Creswell and Clark 2007; Johnson and Onwuegbuzie; Mitroff and Turoff 2002; Robson 2002; Sale *et al.* 2002; Bryman 1996).

On a more practical level, the issues are associated with whether there ought to be some differentiation between research designs that combine qualitative and quantitative data from those that merely employ both types of data. These include transformative designs that change one form of data into another (most often qualitative to quantitative data) so that the data collected by mixed methods designs can be merged (Onwuegbuzie and Teddlie 2003; Caracelli and Green 1993). In this research, a combined approach is adopted to allow the data collected to be merged so as to provide a more holistic view of the problem. The study begins by establishing the theoretical perspective, and the methods adopted and data generated gives an account of structure and meaning from within that perspective (e.g. by showing the structural context of the interactions between different viewpoints studied).

Combining qualitative and quantitative methods is the best approach for the research in that it provides the decision (or policy) maker with a holistic understanding needed to make more informed decisions. There is an expectation that the information drawn from interviews will be complimentary – and of added value – to questionnaire data. Combining methods provides data upon which to make stronger inferences by capturing and presenting a greater diversity of viewpoints. Qualitative

data focuses on identifying different perspectives on the issues to support the inductive development of strategies to address the problem. Quantitative data, on the other hand, confirms the relationships and views of participants using questionnaires, and statistical analysis to develop numerical descriptions most valuable to identifying key factors underlying participants' views and opinions. More importantly, combining qualitative and quantitative methods recognizes:

- the research problem includes a complex mix of issues (e.g. social, political, cultural), which is best studied from multiple perspectives to gain useful insights
- decision research, on the whole, is carried out in the interest of decision (or policy) makers who require robust analysis of the situation to fulfill their responsibilities, which necessitates exploring the issue from multiple angles
- a qualitative or quantitative method on its own is unlikely to achieve the level of understanding of issues necessary to recommend feasible and practical change

Jick (1979) suggests that the researcher who combines qualitative and quantitative methods to collect and analyse data would have to make judgements to create a 'coherent' whole from many pieces. He argues that throughout the process, the researcher gains improved intuition or feel for the situation and can make a valuable contribution to knowledge.

4.3: The analytical framework based on soft systems methodology

The study uses a modified 'pragmatic' version of soft systems methodology (SSM) to generate debate on what changes to the waste management decision process are 'culturally feasible and systematically desirable'(Checkland 1981; p. 102). The SSM model was labelled by Jackson and Keys (1990) as the most appropriate to study problems of a complex pluralistic context, where the decision maker is tasked with negotiating some consensus among competing interests (or viewpoints). Mingers and Rosenhead (2004; p. 531) have characterised such problems by the existence of:

- multiple actors
- multiple perspectives

- incommensurable and/or conflicting interest
- important intangibles
- key uncertainties

Studies related to science policy acknowledge that group interactional dynamics contribute significantly to the complexity of environmental problems (Chapter 3). In the context of waste, this is evident from the problems that decision makers have coordinating activities among diverse interest groups for successful strategy and plan implementation. On a more practical level, if successful implementation depends on the coordination of multiple stakeholders, then an analytical-deliberative tool is useful for learning how to join different institutional purposes to enhance political decision-making. If, as this research contends, common purpose (in the form of collaborative decision-making) is embedded in successfully integrating social values into technical analyses, then the analytical-deliberative tool will conform to a more participatory 'real-world' research methodology, based on SSM. In this context SSM can be interpreted as a social learning tool for action planning, characterised by the integration of theory and practice, facts and values (Checkland and Poulter 2006).

A central premise of SSM is that socio-cultural values underlie the actions of individuals or groups and patterns of social interaction (Checkland and Poulter 2006), whereby policy problems are mediated by the values that operate as rules governing how stakeholders interact with each other and negotiate roles and responsibilities in decision-making. SSM, as a social learning tool, assumes that a planning response, to be meaningful, will similarly assume a pattern of interaction among participants whereby the process of reflecting on and identifying responses to the problem of waste management and public involvement is ultimately driven by historical situated visions of what constitutes a 'good waste strategy and communication approach'. For a more holistic planning response, technical or process aspects, as well as social or local aspects of the problem situation, are considered. SSM thus encourages participants to explore both technical and socio-cultural values that drive problem definition and response.

As a problem structuring approach SSM is also concerned with reflecting and constituting relations of power in decision-making (Checkland and Poulter 2006).

Power has a number of contested meanings but can be viewed as a social relationship reproduced by concrete actions (Forester 1993) or a dynamic and dense net of ever-present relations (Flyvbjerg 1998). In the context of this research, power is observed from reported tensions and interactions between groups (e.g. elected officials and officers, experts and citizens). The focus is on how competing forms of rationality (Chapter 3), expressed by different groups, gain authority and in turn influence decision-making. Specific attention is given to what ethical judgements guide the actions of stakeholders and how power relations between groups are built up, protected, defended, passed on or relinquished (Checkland and Poulter 2006; Checkland and Scholes 1999). The knowledge drawn upon, whether technical or moral/cultural rationality, and its significance in decision-making is important in exploring the dispositions of power.

SSM as a collective system of inquiry incorporates a technical, socio-cultural and political analysis of issues, with the aim of moving towards 'total system intervention' (Checkland and Poulter 2006). In other words, the goal of SSM is to identify action points that can then become the focus of further inquiry and, eventually, intervention in the form of institutional design. The main benefit of SSM is in its interdependent inquiry system that facilitates critical reflection on the multiple perspectives that are embedded in, and drive, socio-technical systems such as waste management.

4.3.1: Theoretical assumptions of soft systems methodology

Checkland (1981) argues that processes of decision-making can be explained by using system ideas. Systems thinking originated from Jenkins and Optner's concept of 'hard' systems from the mid 1960s (Jackson and Keys 1984). This concept bore explicit descriptions of objectives, inputs and functions of a system. The clear definition of the objectives allowed systems to be engineered to achieve specific outputs. The approach had a problem-solution focus, underpinned by the positivist's philosophy that knowledge to enhance the operation and output of a system was most reliable when science was used to analyse and prove theories (Checkland 1999).

The new 'soft' systems thinking emerged as a result of the complex pluralistic context of problems. The ideas around the concept came together in a general system movement to replace previous analytical approach with a more holistic approach (Hammond 2003). Soft systems thinking is based on the assumption that in any given human situation contained people acting purposefully, not simply by instinct or at random, towards a desired outcome. Occasionally, purposeful action could be in pursuit of explicitly defined objectives, so the broader definition of 'soft' systems included goal seeking but was not limited to it. Soft system thinking as a problem structuring method offers a way of representing the situation (usually in the form of a model) that enables participants to clarify their predicament, converge on a potentially actionable mutual problem or issue within it, and agree commitments that will at least partially resolve it (Checkland and Scholes 1999). The method of analysis includes an examination of the links and interrelationships of the whole system, patterns and themes that emerge which offer insights and new meaning to the initial problem. The analyses focus on three main aspects: the intervention itself (the issue and desired/feasible changes), a social analysis (the culture) and a political analysis (the disposition of power) (Checkland and Poulter 2006).

SSM is based on the assumption that people develop by appreciating perceptions and points of views. The way in which these are incorporated into personal viewpoints can be described as an appreciative system. People make sense of the world and everyday experiences by making judgements depending upon past prejudices and present interpretations of experiences. This leads to a judgemental framework through which decisions are made (Davies and Ledington 1991). In principle the philosophy of this approach is similar to social constructionism where emphasis is placed on an appreciation of different constructions and meanings that people place upon their experience, which may delay or override the need for action. However, the characteristic idea of pragmatism is based on "a philosophy of democracy... a hopeful, melioristic, experimental frame of mind" (Rorty 1999; p.20, 24). This implies ideas and practices are judged in terms of their usefulness, workability, and practicality – a perspective that stresses the priority of action over an appreciation of views (Rorty 1999).

4.3.2: The limitations of soft systems methodology

Soft Systems Methodology (SSM) has been practised successfully in many cases and has been used for solving semi-structured and unstructured problems of organisations (Liu 2006; Kolkman *et al.* 2003). However, managers have criticised the open ended nature of SSM, which they say makes it impossible to manage organizational change (Stacey 2003; Iles and Sutherland 2001). A critical phase in waste management decision-making is choosing a form of action based on a unified (or consensual) perspective of the problem. SSM is a learning cycle and the application does not necessarily lead to the settlement of a problem but rather creates new versions of it for further study (Checkland 1999).

The systems thinking concept (based on 'pure world' views) makes the process of reconciling perspectives difficult as the concept is embedded in depolarisation. Since waste management decisions involve numerous stakeholders, the SSM process may become unmanageable as the number of perspectives on the issues increases. Nevertheless the general concept of SSM as a problem structuring technique is beneficial in that it allows alternative positions to be brought into conjunction with each other to explore underlying values in an attempt to develop better representation of the issues (Checkland and Scholes 1999; Davies and Ledington 1991).

De Bruijn and Heuvelhof (1999) and Jong (1999) discussed measures such as effectiveness, efficiency and user satisfaction as a useful approach to evaluating the quality of policy decisions. Approaches based on hard systems thinking adopt standards limited to effectiveness and efficiency. The idea here is that the decision-making process is initiated to solve a problem - a solution-oriented approach. The decision is said to be more effective if it contributes more to the solution of the problem. Hence, if this aim is achieved with minimum cost and effort, the decision is said to be efficient. However the standards assume there is only one problem or problem owner. If there are multiple owners, this standard is no longer unambiguously applicable as complex pluralistic decision processes involve a large number of actors, each with their own interests and objectives. In addition, objectives change in the course of time but effectiveness measurements are often performed with reference to problems or objectives as they were at the start of the process. This method of evaluation ignores the dynamic aspects of objectives. On

this basis, learning processes which cause actors to view their own interests in a different light and adjust their objectives would be identified as a source of ineffectiveness.

Checkland tried to address these issues through the SSM approach based on a broader definition that includes problem solving. A subjective interpretation of SSM (based on the constructionist philosophy) as distinct from the pragmatic version, implies an emphasis on qualitative standards such as stakeholder satisfaction. According to De Bruijn and Heuvelhof (1999) and Jong (1999), quality standards based on satisfaction are quite different from those based on effectiveness and efficiency. In this context decision-making is seen as successful if the actors involved are satisfied with the decision taken. It accounts for the fact that several actors are engaged with the issue, that the actors are pursuing different objectives which are dynamic in nature. However, there are limitations inherent in the pure subjective interpretation of SSM as a decision may be poor (in terms of its outcomes) even if all actors are satisfied with it. Satisfaction and quality are not synonymous. For example, consensus decision-making on a waste management issue may result in poor environmental consequences.

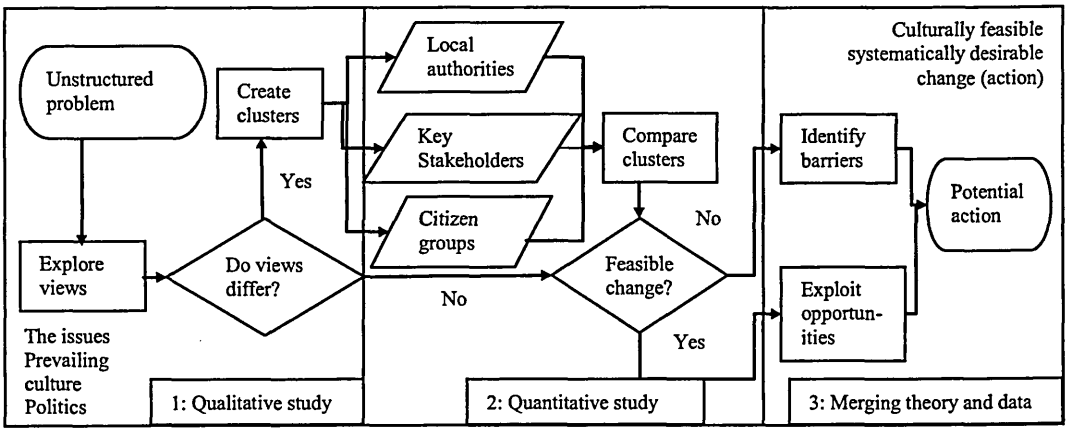
4.3.3: A modified version of soft systems methodology

This research is therefore based upon a pragmatic interpretation of SSM. The philosophical foundation is based on intersubjective reasoning which is reflective of pragmatism. This is an attractive approach to real world research and can be characterised as scientific (i.e. based on measurable evidence). It is presented as a model of scientific explanation which avoids both positivism and relativism. The philosophical view is that there is no unquestionable foundation for science (i.e. no 'facts' that are beyond dispute). It is accepted that knowledge is a social and historical product and 'facts' are theory-laden. The real world is viewed as complex and stratified into different layers and social reality incorporates individual, groups and institutional, and society levels (House, in Robson 2002).

The modified approach addresses the issues raised regarding the subjective interpretation of SSM. It is a more problem-oriented approach (Figure 4.2), where the focus is on exploring the issues fully before identifying action to capture both

similar and divergent views of the problem as well as identify opportunities and barriers to potential action.

Figure 4.2: A problem-oriented approach.



Source: Based on Checkland's (1981) Soft System Methodology

The method for analysing and interpreting data is based on SSM's mode of analysis that focuses on participants' interests and vision for change, the socio-technical context, the existing culture and the politics that may define the feasibility and desirability of change. A rigorous and systematic approach to interrogating the data captures these contextualised issues and identifies action points (Table 4.1).

Table 4.1: SSM form of analysis

Context for analysis		Questions for interrogating the data
The issue	Problem conceptualisation depends on the level of perspectives taken	Who can be identified as an issue owner? What are the different perceptive on an issue?
The prevailing culture	Problem definition carries an implicit judgement of the values underlying stakeholders' actions	What are the formal and informal roles of stakeholders? What behaviour and norms are expected of stakeholders in certain roles? What are the ethics or values by which the behaviour of stakeholders are judged?
The politics	Problem definition carries an implicit judgement of the ethics in a position taken on an issue and the disposition of power in decision-making	How is power expressed in the decision situation? What factors can be identified that signal power is possessed in the situation? How is power used, protected, defended, passed on, relinquished, etc.? Can power structures be identified to show how different groups take deliberate action in pursuit of their own interests/objectives?

Table 4.1 (continued): SSM form of analysis

Context for analysis		Questions for interrogating the data
The intervention	Identifying desirable or culturally feasible action, based on negotiated values of different stakeholders	What are different groups' aspirations and desire for intervention? What are the characteristics of the issues that lead to desirable intervention; is the intervention considered feasible (i.e. practical)? How are different groups likely to assess (or judge) the success of the intervention?

Source: Checkland and Poulter (2006); Checkland (1999); Checkland and Scholes (1999)

The pragmatic interpretation of SSM is based on a negotiated view of the problem where there is a specific start and end to the process. The objective is to identify similar ideas for action to resolve issues in light of the opportunities presented but also the barriers that exist. Potential actions (or solutions) identified are in pursuit, but not limited to standards that include efficiency, effectiveness and stakeholder satisfaction. The main considerations are in line with key themes for the research:

- ***perceptions of the waste problem*** – are different perspectives of waste management issues (including goals and priorities for sustainable waste policy) given sufficient consideration
- ***opinions and attitudes to early public involvement*** – what conditions are likely to ensure stakeholders are satisfied with the process and outcome of public involvement initiatives

In summary, the approach attempts to put across explicit views on the issues. In this case a 'negotiated consensus' may be achieved across clusters of opinions. However, the premise for success lies with the degree of 'fit or match' between the underlying theoretical predictions and the data collected. Having established the philosophical and methodological foundation for the research, the next section describes the methods, form of analysis and the strengths and limitation of the study.

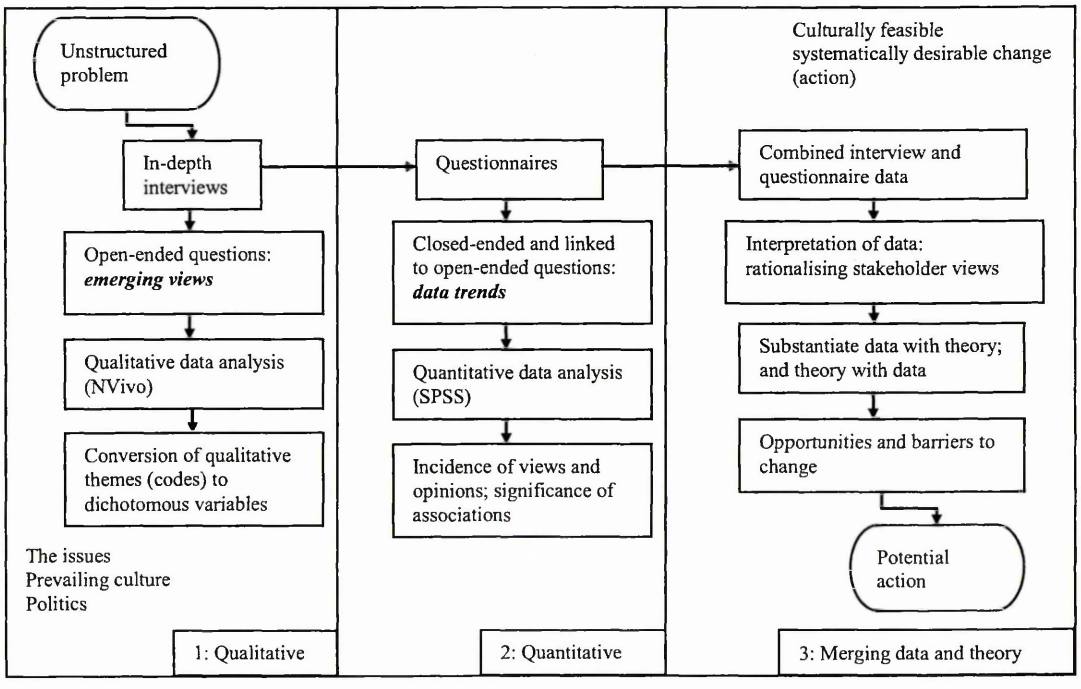
4.4: Data collection and analytical framework

A data collection and analytical framework was developed for exploring the perceptions and judgement of stakeholders, the complexity of waste management issues, and the theoretical and practical demands for a more participatory and adaptive decision process. . The first stage involved the collection and analysis of

qualitative information which provided preliminary results that led to the collection of quantitative data. The analysis of interviews captured in a contextualised form (i.e. political, social, technical, cultural) the main entities, structures and viewpoints in the situation, the processes going on and the main issues. This data produced a number of sub themes associated with the broad research themes, which were then coded into dichotomous variables that formed the basis of the questionnaire (Figure 4.3).

Analysis of quantitative data generated descriptive statistics to measure the incidence and variation in participants' opinions and facilitated an exploration of data trends and common associations to verify and augment results from the first phase of the study. Statistical analysis highlighted important similarities and differences across groups. These values were often used to return to the qualitative data for the necessary evidence to rationalise particularly interesting or ambiguous questionnaire responses. Similarly, statistical relationships were also given meaning by confirming the patterns revealed with the qualitative data; thus simplifying the process of combining qualitative and quantitative data (Chapter 7).

Figure 4.3: Sequential data collection and analysis



A framework for organising data collection and analysis was constructed based on the theoretical perspective presented in Chapter 3. This was positioned within the soft system methodological context of analysis (Chapter 4.3) and presented as a range of questions that focused on participants' interests and vision for change, the socio-technical context (the relevant expertise, interests, assumptions and judgement), the existing culture and the politics that may define the feasibility and desirability of change.

The framework was instrumental in selecting participants' views which formed the basis of the questionnaire that was used to correlate opinions and attitudes expressed by the different groups of participants. The focus was on exploring the issues fully before identifying (or formulating action) to capture both similar and divergent views of the problem as well as identify opportunities and barriers to potential action (Checkland and Poulter 2006; Checkland and Scholes 1999). In this regard it was important to capture not only the majority view expressed on an issue but also the minority; regardless of whether it differed significantly from the mainstream or was considered radical or irrational by other participants.

A method for comparing data across groups was applied in order to capture and contrast multiple perspectives on the issues and to establish opinions in a more systematic way (see Figure 4.3). Throughout the process, new points that emerged, particularly local examples, were brought into the analysis to provide evidence of participants' judgement, interest or positions on issues.

4.5: The qualitative study

Qualitative information was gathered from a series of 32 in-depth interviews, using open ended questions, to generate a typology of variations in perceptions of the waste problem and establish attitudes towards early public involvement. The time taken on interviews ranged from 45 minutes to 1.5 hours, and the total amount of tape recorded material was approximately 36 hours. The interviews were carried out with representatives from local authorities, key stakeholders and citizen groups. Most were semi-structured, relying on a list of pre-defined issues so as to allow a free flow of ideas and information around specific themes. The interview questions

were framed around the research themes (Chapter 1) so as to explore a few issues in-depth, and the probing technique was used to solicit additional data on 'emerging themes'. This structure provided more focus than the conversational approach, which was adopted for some interviews, but still allowed for a degree of freedom and adaptability in that participants' perspectives shaped the discussion around issues. A list of questions covered in interviews is provided in Appendix A.

4.5.1: Sample selection and data collection strategy

A sample from various clusters within the population was used to illuminate the complex issues inherent in waste management. The sample was stratified into three categories according to common interests (i.e. local authorities, key stakeholders and organised citizen groups) to ensure a wide range of interested and affected parties were represented and to capture and describe the divergent as well as common interests of participants. Table 4.2 summarises the approach to sampling and data collection.

Table 4.2: Qualitative study: sampling and data collection framework

Research Phase	Sample strategy & technique	Data collection method	Sample size	Criteria for sampling (see Chapter 3)
Qualitative Study	*Judgement sampling:* maximum variation sample across 3 groups	Semi-structured and open interviews	32 participants (10 / 12 per interest group)	Must be a stakeholder in the decision process Must have expert, local/anecdotal or procedural knowledge of waste management Must be a representative of an organisation within a particular interest group

The sample selection strategy was informed by Aggens' (1983) analogy of participation and care was taken to include representatives from each category of participants (Chapter 3). Sample selection consisted of two tasks. First, to identify and categorise stakeholders from which key informants (e.g. local authorities, industry experts and environmental lobby groups) were drawn and second, to select a good spread of representatives after consulting with key informants. Sample selection included several tasks:

1. Reviewing consultation lists developed by government agencies, regional and local authorities' for national and local waste strategies. Consulting other

actors such as the Local Authority Recycling Advisory Committee (LARAC) and the Local Government Association (LGA) to develop a definitive list of stakeholders across the waste sector.

2. Developing a general list of consultees under main categories (e.g. *local authorities* – unitary, disposal or collection authorities; *key stakeholders* – regulatory such as the environment agency; industry representatives such as waste management operators/consultants; other parties such as non-governmental or private sector representatives; *citizen groups* – environmental campaign groups or community/local action groups etc.)
3. Selecting a sample of key players from 'each category' and soliciting their opinion on whether other organisations (and their representatives) should be included on the list.

4.5.2: Profile of participants

Participants were drawn from a range of backgrounds and with various interests in waste management. Instead of individual experts, the participants selected for interview were representatives from a number of institutional or non-institutional organisations with an interest in waste policy and/or local waste management practice (Chapter 2). Time and resource constraints meant that the sample size was limited to a minimum of 10 participants from each sample group (Table 4.4).

Table 4.3: Profile of participants

Sample categories	Sub-groups	Institutional and non-institutional actors	Participating organisations
Local Authorities	Local government	Unitary authorities	Hull City Council Warrington Borough Council Milton Keynes Council Sheffield City Council City of York Council Newcastle City Council Birmingham City Council
		Waste disposal authorities	Surrey County Council
		Waste collection authorities	Borough of Haringey Council Ribble Valley Borough Council
Key stakeholders	Government and government related	Government agencies, departments and other related organisations	Defra Defra, Waste Infrastructure Development Programme (WIDP) Environment Agency Communities and Local Government Waste Recycling Action Programme (WRAP) Local Authority Recycling Advisory Committee (LARAC)

Table 4.3 (continued): Profile of participants

Sample categories	Sub-groups	Institutional and non-institutional actors	Participating organisations
Key stakeholders	Waste industry	Private sector organisations	Environmental Services Association
		Professional associations	Chartered Institution of Waste Management (CIWM) WARMNET (Northampton University)
		Waste management companies	Viridor Veolia
		Waste management consultants	Eunomia
Citizen Groups	Environmental	Community networks/organisations	Global Action Plan
		Environmental lobby groups	Friends of the Earth
		Community action groups	Banwaste Hull and Holderness Against the Incinerator (HOTI) York Friends of St. Nichols Field
Citizen Groups	Ordinary citizens	Members of citizen advisory groups on waste	Seven members of Warrington Citizen Advisory Panel One member of Milton Keynes Citizens Advisory Panel
		Convenors / facilitators of stakeholder engagement processes	Dialogue by Design Hyder Consulting Open University

4.5.3: Pilot study

Two interviews were carried out as part of a pilot study. The first was a semi-structured interview with a local authority representative which lasted 1½ hours. The second was an unstructured interview with a representative from a community action group and that lasted 1 hour. The main objectives were:

1. to test the interview technique and assess the quality of data gathered
2. to assess how different groups of participants responded to questions (e.g. local authorities and citizen groups)

The unstructured interview, characterised by a conversational, informal style was not intended for use as a data gathering technique in the (more comprehensive) study. A semi-structured interview was planned to provide a common basis upon which to compare responses and enhance the quality and consistency of data. The use of unstructured interview techniques in research have raised questions about the ability to cover material consistently, the impacts of spontaneous questions on the quality of data, among other sources of bias (Herbert *et al.* 1999).

Although the semi-structured interview is considered easier to justify scientifically in terms of its validity and reliability (Hutchinson and Wilson 1992; Weisner and Cronshaw 1988); it was not a suitable method to gather data from the citizen group representative because they preferred to discuss personal experiences with waste facilities rather than wider environmental issues associated with waste management. Responses to questions on generic issues were usually short and not relevant to the subject, while responses to questions on personal experiences were much longer and contained richer information. For example, the participant preferred to discuss objections to plans for a joint waste facility close to a residential community, rather than provide an opinion on key factors for local authorities to consider in developing an effective municipal waste strategy.

A key characteristic of the personal accounts from participants (mainly in key stakeholder and citizen groups) was the way in which each participant constructed the behaviour of other parties (e.g. local authorities) as reasonable or unreasonable, which implied considerable moral reflection was given to defining the roles and responsibilities of those involved in the situation - a detail that may not necessarily have been revealed in a semi-structure interview. Nevertheless it was important that the empirical data collected in interviews was associated with a theoretical referent so the underlying theory behind questions prepared for a semi-structured interview was maintained in spontaneous (open) questions.

4.5.4: Data quality and limitations

Researchers have expressed many concerns regarding the subjective nature of qualitative data; often questioning the validity of the findings (Robson 2002; Seale 1999). Thus one objective of the mixed-methods approach is to increase confidence in the validity of the findings by addressing weaknesses in both the qualitative and quantitative designs. Nonetheless, issues around the validity of the qualitative data and the wider implications for the research need to be addressed.

Sample selection bias

One of the concerns in producing qualitative data is whether the findings can be generalised to reflect the views of the wider population. In general, qualitative

studies do not provide the same level of statistical generalisation expected from quantitative studies, where the researcher is able to control context and competing variables to ensure data validity. In contrast, qualitative research tests a path of theoretical development, usually in social (or uncontrollable) settings, so other strategies must be adopted to reduce issues around sample bias.

The co-nomination sampling procedure adopted for this study can result in biased samples, because experts may co-nominate colleagues that represent similar interests or values. Nedeva *et al.* (1996) suggests that co-nomination is a good start, but certain basic factors such as professional background should be checked to ensure there is a spread of interest across the sample. Separating the sample across three main groups, based on institutional, professional or organisational background was a useful way of ensuring a wide range of stakeholders was represented in the sample. Nevertheless, there were notable groups omitted from the sample which potentially introduces sources of bias in the data.

Mass media were excluded from the sample because they are not actively involved or affected by local waste management decision-making. Regional authorities were also not targeted for interviews as their interest in municipal waste management is less clear, with policy flowing directly between central and local government with little communication with regional bodies (Bulkeley *et al.* 2005). Perhaps more significant is the omission of categories of politicians and local councillors with obvious interests and responsibilities for waste management. Not only are there difficulties accessing these groups, there is also the problem that the views of individual politicians on waste issues are likely to conform to 'party' opinion. This introduces probable biases in small samples where group homogeneity of interests can skew the data.

Despite efforts to solicit a range of participants with different interests and responsibilities for waste management, it is possible that bias resulting from group homogeneity of interests was present in the sample. This is because the resultant sample was self-selected, comprising those interested in the study and willing to participate. Potential bias in the sample may include:

- ***Selection and sampling bias*** – participants are contacted but then effectively volunteer to take part in the research, reducing the researcher's control on the spread of interests captured. For example, participating local authorities tended to be those that had *ad hoc* or limited experience with more deliberative forms of public engagement. Similarly participants in the citizen group category included anti-incinerator activists or environmental lobby organisations with an anti-incineration agenda as they are often engaged in the waste policy debate.

- ***Participation bias*** – a result of selection/sampling bias is that the views and opinions captured in the study may not necessarily be representative, such as obvious dissatisfaction with waste management practice/policy (particularly those based around EFW incineration) or little local authority experience with innovative forms of public engagement on both strategy and facility plans.

The research methodology attempts to circumvent problems associated with sample selection bias by capturing divergent as well as common views, giving both the collective voice and those in the minority an opportunity to be heard. It is possible that undue attention will be paid to the 'collective voice' or the majority view/opinion on an issue, so it is suggested that the findings should not be understood as typical of the current situation regarding waste management decision-making and public involvement. Rather, the main advantage of the qualitative study is that the data offer a deeper insight into issues raised by participants involved in the research.

For the sample of participants involved in the study, the findings offer a better understanding of issues such as dissatisfaction with waste policy and practice and the cultural and methodological challenges some local authorities experience towards more participatory and deliberative forms of engagement. In relation to the research objectives (Chapter 1), the potential biases associated with sample selection does not significantly affect the validity of the findings since the empirical data gathered is contrasted to, and combined with, current theories and practice of public involvement in environmental planning (Chapter 3). This enhances the validity of the

study by providing more comprehensive information to draw out key principles, upon which recommendations for an analytical-deliberative framework are based.

Data reliability and validity

A further concern of qualitative research is the repeatability of the study, often considered in terms of data reliability or validity (Golafshani 2003; Herbert *et al.* 1999). An objective of the research was to generate different perspectives on issues, so it was necessary for the interviewer to introduce counter-arguments at strategic points during the interview to solicit (or stimulate) a range of views of the problem. However, in qualitative research, interviews are usually conducted by a neutral or sympathetic interviewer to avoid problems related to bias and reliability of data (Robson 2002; Herbert *et al.* 1999). Hence there are concerns around the reliability of data associated with the explicit and implicit ways in which contra-arguments were presented to participants. To circumvent this problem, personal views were isolated by using expressions such as "often a counter-argument to the point you are making is that..." or "a representative from the ... group felt that ... do you agree or disagree with this position ... what is your view on this issue?".

Representatives of organisations that met the selection criteria (Table 4.2) were approached by contacting senior managers (e.g. Chief Executive Officer or Head of Department) in each organisation by telephone. In most instances the manager contacted participated in the interview but on other occasions, a senior level management representative was put forward to participate in the interview. Some local authorities had representatives from both waste management and planning departments to provide opinions on issues associated with both waste strategy development and facility planning. In other cases, senior level management opinion was provided in both areas. Participants in the citizen and key stakeholder groups were selected from the same local authority districts in the sample, where possible, to compare information gathered and assess issues related to misrepresentation of information.

There were, however, concerns associated with whether the opinion of participants was based on an established and potentially credible organisational view or 'snap judgements' that reflected an individual and potentially less credible position on an

issue. Although participants were made aware that an organisational view was required, some felt that their own view differed from what they regarded as an organisational view. For instance, one local authority participant felt that councillors supported a 'no incineration' policy which went against the views of senior local authority officers. Some participants explicitly stated their view was an individual one as opposed to a representative view of the organisation. In other cases, participants asked to remain anonymous in written reports. Some authors on research methodology have claimed that individuality and anonymity are the main reasons for hasty 'snap judgements' instead of cautious consideration and thorough analysis of the issue (Golafshani 2003; Herbert *et al.* 1999; Webler *et al.* 1991). Nevertheless, the paradox of individual and organisational views is itself useful information to illustrate factors such as politics and power that exist in decision-making.

General limitations of the study

The interviews provided preliminary data and revealed the need to capture additional views in order to supplement or challenge initial findings. The initial analysis did not reveal that any significant revision of the interview strategy would add decisively to the quality of results; although there were some areas where additional questions may have encouraged more indepth reflections in the groups. For example, it may have been interesting to confront local authorities with explicit questions about the potential influence of government targets such as LATS on their perceptions, interpretations and ability to make 'rational' judgements concerning sustainable waste management (e.g. Slater *et al.* 2007). Undoubtedly this would result in interesting reflections but the strategic motives for soliciting such opinions could not be eliminated so participants were encouraged to pursue their own reflections on the priorities of different stakeholders.

The groups identified and debated a range of concerns in relation to sustainable waste management and the challenges and benefits associated with engaging the public more actively in solutions proposed. Their arguments imply that these issues are in the domain of a technical/moral/emotive rationality (Habermas 1984) qualitatively different from that of expert (or scientific) knowledge and technology itself. Generally participants reflected on the moral or ethical positions of others instead of pursuing critical self-reflection, possibly avoiding potentially

discomforting reflections on their own positions. This is consistent with social psychological theory of cognitive dissonance, which describes how people suppress certain attributes of their motives in order to maintain a consistent and positive self understanding (Harmon-Jones and Mills 1999).

Overall, there is a danger that oversimplifying the complexity of waste management issues may lead to unrealistic interpretations of the motivations, values and power of rationalisation among different groups. Although the findings may frustrate those who perceive recommendations as 'irrational', 'unrealistic' or 'overzealous in support of technical rationality' (see Chapter 5 and 7), it should be understood that the complex nature of the municipal waste management problem necessitates an exploration of different value systems (i.e. policy makers, experts, citizens etc.). In the qualitative analysis effort was made to highlight both divergent and similar views (including minority views). This is in keeping with the soft system methodological approach that aims to introduce an appreciative setting in which alternative views (whether supported by science or based on individual experience or judgement) could be put forward without fear of repression from conformity inducement.

4.6: The quantitative study

The quantitative study used a questionnaire to measure the incidence and variation in participants' views of the waste problem and opinions and attitudes towards early public involvement. Questions from previous interviews were included in the questionnaire to assess the relative importance and links between themes that emerged (summarised in Chapter 5). This approach was adopted to better understand the underlying reasons behind stakeholder attitudes and to deal effectively with the challenge of evaluating different views of the problem and providing justification for proposed action.

The design of the questionnaire was a multi-stage process including the definition of stakeholder views and opinions to be examined and a pilot study that tested the questionnaire for format, sequence and comprehension. The main objectives were to:

1. establish a clear goal and purpose for the questionnaire and ensure questions were specific to the research problem;

2. develop a clear set of questions free from ambiguity to reduce error associated with bias and misinterpretation;
3. establish a logical flow of questions to maintain participants' interest;
4. establish the scale for measuring responses so that data gathered was statistically reliable.

Some of the challenges and limitations experienced in administering questionnaires are discussed below and a copy of the questionnaire is in Appendix B.

4.6.1: Sample selection and data collection strategy

The questionnaire sample was clustered into three categories (i.e. local authorities, key stakeholders and organised citizen groups). Sub categories were refined based on feedback from interviews, where some participants either felt they belonged to a different sub group or that some were incorrectly defined. For example, one participant felt that stakeholder engagement practitioners were best place in the 'key stakeholder' category.

A random sample of clusters was adopted to reduce error due to sample bias. The population for the sample was unknown since any number of individuals, groups or organisations may claim to have either a direct or indirect interest in waste management. A probable grouping of the population was assumed based on common interest and clustered to represent key institutional and non-institutional actors across the waste sector. Participants' interest in waste was chosen as the main selection criterion because it seemed reasonable to assume that it will be related to stakeholders' attitudes. Other criteria were considered in selecting participating organisations (Table 4.5).

Table 4.4: Quantitative study: sampling and data collection framework

Research Phase	Sample strategy or technique	Data collection method	Sample size	Criteria for sampling (see Chapter 3)
Quantitative Study	Cluster sampling	Questionnaires	60 participants (between 15 to 26 per interest group)	Must be a stakeholder in the decision process Must have expert, local/anecdotal or procedural knowledge of waste management Must be a representative of an organisation within a particular interest group

The type of organisation (e.g. sector, main business or service), the organisation's responsibility or interest in waste management (e.g. waste campaigner, regulator for waste management facilities) and geographical location (e.g. Yorkshire and the Humber, East of England) were additional factors used to sub-divide institutional and non-institutional categories so that different groups of stakeholders, across the country were included in the sample. For instance, the local authority category was first sub-divided according to geographic location and then into three categories (i.e. unitary, disposal and collection authorities).

A random sample was then selected from each sub-category. A similar approach was used for the other categories (i.e. key stakeholders and citizen groups). However, considering the general population was unknown, the same proportion of organisations in each stratum was selected in attempt to make the sample proportionate. However, the resultant sample was self-selected and not proportional across groups which required some consideration in presenting and interpreting statistical information (Section 5.3.5).

4.6.2: Profile of respondents

Participants in the quantitative study were representatives of a number of institutional or non-institutional actors with an interest in waste policy and/or local waste management practice. The 60 participating organisations included 26 respondents from the local authority group, and 17 from both key stakeholder and citizen groups. A list of participating organisations is provided in Table 4.6.

Table 4.5: Profile of respondents

Sample categories	Sub-groups	Institutional and non-institutional actors	Participating organisations
Local Authorities	Local government	Unitary authorities	Peterborough City Council Nottingham City Council Milton Keynes Council Warrington Borough Council Bath and North East Somerset Council Somerset County Council Southampton City Council Luton Borough Council Telford & Wrekin Council Sheffield City Council Hartlepool Borough Council Rutland County Council Portsmouth City Council

Table 4.5 (continued): Profile of respondents

Sample categories	Sub-groups	Institutional and non-institutional actors	Participating organisations
Local Authorities	Local government	Waste disposal authorities	Devon County Council Leicestershire City Council Merseyside Waste Disposal Authority Surrey County Council
		Waste collection authorities	Scarborough Borough Council Ryedale District Council Three Rivers District Council St. Helens Council Rushcliffe Borough Council Hinckley & Bosworth Borough Council Salford City Council Selby District Council Fenland District Council
Key stakeholders	Government and government related	Government agencies, departments and other related organisations	Highways Agency Environment Agency (Y&H) Waste and Recycling Programme (WRAP) National Environmental Research Council (NERC) Local Authority Recycling Advisory Committee (LARAC)
		Regional government agencies	Government Office of East Midlands
		Convenors / facilitators of stakeholder engagement processes	Open University Hyder Consulting
Key stakeholders	Waste industry	Private sector organisations	London Remade The Environment Council
		Professional associations	Chartered Institution of Wastes Management (CIWM)
		Waste management companies	Biffa (Warwickshire) Veolia Environmental Services (Cheshire) WEM Thompsons Ltd. Greater Manchester Waste Ltd. UPM Paper Recycling
Citizen Groups	Environmental	Waste management consultants	WamCal Ltd.
		Community networks/organisations	Essex Community Reuse and Recycling Network (ECORRN) Rother Environmental Group The Recycle Works Ltd.
		Wildlife trust	Yorkshire Wildlife Trust
		Environmental lobby groups	Zero Waste Alliance UK Ban Waste York Friends of St. Nichols Field Nuneaton Friends of the Earth
		Community action groups	Safety in Waste and Rubbish (SWARD) Burton Joyce Residents Assoc. Hull and Holderness Against the Incinerator (HOTI) Cork Harbour Alliance for a Safe Environment (CHASE)

Table 4.5 (continued): Profile of respondents

Sample categories	Sub-groups	Institutional and non-institutional actors	Participating organisations
Citizen Groups	Ordinary citizens	Citizen advisory groups and community representatives	Three members of Warrington Citizen Advisory Group on Waste Representative of Culcheth Methodist Church (past member of Warrington Citizen Advisory Group) Local resident and past member of Warrington Citizen Advisory Group

4.6.3: Pilot study

A pilot study was conducted to test the questionnaire's format, sequence and comprehension. Five questionnaires and feedback forms were sent out to each group within the sample (i.e. local authorities, key stakeholders and citizen groups) (see Appendix C for a copy of the questionnaire evaluation and feedback form). A sample of representative organisations from the target groups were selected to participate in the pilot study. Six organisations participated (a response rate of 40%) which included:

1. ***Local authorities***: Hull City Council and Warrington Borough Council
2. ***Key Stakeholders:*** Defra, Waste Infrastructure Development Programme (WIDP) and a Stakeholder Engagement Facilitator at the Open University
3. ***Citizen Groups:*** Hull and Holderness Against the Incinerator (HOTI) and Banwaste

The feedback from the pilot study was used to refine the structure, sequence and content of the questionnaire. Generally the comments related to comprehension of questions. For example, some participants felt some of the concepts and terms related to waste management would be a challenge for respondents in one form or the other. But the majority of concerns were around the options set for 'municipal waste management targets and technologies'. Most participants felt that aspirations for waste management targets should be set out in a separate question from preferences for residual waste management technologies so that there is a clear measure of each variable. This also allowed for soliciting views around recycling while staying within the research focus and developing a hierarchy of preference for residual waste treatment technologies. In this regard, a wide range of residual waste management technologies such as thermal and non-thermal options was included so

as not to show a bias with respect towards more popular options such as EFW incineration and mechanical biological treatment. A collation of comments from participants and general feedback is provided in Appendix C and these were used to finalise the questionnaire.

Some researchers argue that the language and tone of questions as well as the terms used can induce inaccuracies in survey data (Fowler 1995), so restricting the use of technical or emotive terms that potentially confuse, frustrate or anger respondents is important to avoid misinterpretation or misrepresentation of data. However, attempts to use 'neutral' language, for example 'energy from waste' (EFW) (a less emotive description for 'incineration with energy recovery'), was met with resistance by some respondents to the pilot questionnaire (see Appendix C). Hence, the final version of the questionnaire used the term 'incineration' while making it clear in the description that energy recovery was included.

Nevertheless it is important to consider how the term 'incineration' impacted on the views solicited. The literature clearly establishes the poor image of incineration (see Chapter 2). Alternative terms such as 'EFW' and 'combined heat and power' have replaced 'incineration' to make explicit the energy recovery component; however, these terms may also evoke hostile reactions from the public. For example, a participant in the pilot study felt the term EFW was 'jargon coined by the waste industry to disguise the use of incinerator technology' (Appendix C). This paradox implies that either term (EFW or incineration) is likely to solicit reactions from respondents in one form or another, which is difficult to predict and control.

Any explicit reaction to the term 'incineration' is relevant to the research, since current emotions around the technology need to be captured. The issue of misrepresentation or misinterpretation of the energy recovery component of the technology is addressed by offering a clear description of the incineration process. The questionnaire results show that perhaps a more significant limitation is whether respondents, particularly those in the citizen group, had a clear understanding of the more advanced treatment and disposal technologies listed in the questionnaire (e.g. pyrolysis, gasification, plasma arc). Potential inaccuracies in the data resulting from

a lack of knowledge of waste management technologies, wider environmental issues and public involvement are further discussed in Section 5.3.5.

In the final version of the questionnaire (Appendix B), effort was put into selecting options that were mutually exclusive, in each question. A wide range of options were included to capture different perspectives or aspirations from different stakeholders. For instance, the suggestion that 'there should be some sort of national statement on the health effects of incineration facilities' was included in the questionnaire, even though some participants in the pilot felt it was unrealistic. It was important to accommodate different views on waste issues so that, in formulating an accommodated view, those that hold other views would feel it was possible to communicate with others (Davies and Ledington 1991). An open ended question was included towards the end of the questionnaire to capture other opinions related to waste management issues and public involvement.

4.6.4: Administration of questionnaire

A total of 345 questionnaires (115 per interest group) were sent out to institutional and non-institutional actors in the waste sector and 60 organisations responded (a response rate of 17.4%).The cover letter on the questionnaire emphasised the potential contribution of the research to local waste policy, particularly the delivery of waste strategies which encouraged organisations to take part (Appendix D). The questionnaires were distributed to participants by email to avoid the high costs and waste associated with postal surveys. The response rate from local authorities was encouraging compared to the key stakeholders and citizen groups. In September 2008, the Chartered Institution of Wastes Management (CIWM) and the Local Authority Research Council Initiative (LARCI) issued a notice (Appendix E) in their electronic newsletter inviting members to participate in the research. This was instrumental in boosting responses in the key stakeholder group. Additionally, the Warrington Borough Council, an organisation that participated in qualitative study, invited members of their Citizen Advisory Panel on Waste to respond to the questionnaire in an article published in the Council's newsletter to members of the citizen panel (Appendix F). Overall, the publicity initiatives boosted the response rate by about 5% and a series of reminder letters and personal telephone calls increased responses to 17.4%.

4.6.5: Data quality and limitations

A closed format questionnaire was adopted to make it possible to calculate percentages and other statistical data over the whole group and sub groups of respondents. One disadvantage of closed questions is that it decreases the likelihood of receiving unexpected and insightful views as it is not possible to predict the full range of opinions (Converse and Presser 1986; Graham and Shuman 1982), so each question included an option for respondents to raise other issues and shed new insights on the research themes. A major challenge was devising a way of including sufficient choices that fully cover a range of views from different stakeholders and at the same time ensure there was adequate distinction between views. Generally this translated into three to thirteen possible responses to questions.

Scale of measurement

The scale of measurement is an important variable in considering the accuracy of survey data and the possible implications on the research. The questionnaire measured attitudinal questions, such as respondents' views of early public involvement, over a complete range (i.e. most important to least important, strongly agree to disagree). For these questions, the Likert scale included a neutral or 'no opinion' response. However, other questions such as preferences for waste management technologies or stakeholder priorities omitted the neutral response, thus requiring respondents to state a clear preference or choice among options. Usually the 'don't know' response on more 'factual' questions allows the researcher to assess whether data accuracy is affected by respondents' lack of knowledge or information on a particular issue (Fowler 1995). It is equally arguable that the 'neutral' or 'don't know' answer is over-utilised, especially by bored participants. This is mostly relevant in cases where very large numbers of choices are used, such as large-scale marketing surveys or public opinion or satisfaction surveys (Fowler, 1995; Alwin and Krosnick, 1985). Some researchers claim the impact of omitting a 'don't know' response on 'attitudinal' questions is not significant (Fowler 1995; Poe *et al.* 1988) and that an even number of choices forces participants to 'get off the fence' on a particular issue. For the purpose of the research, the responses on either side of neutral (e.g. strongly agree / agree and strongly disagree / disagree) were grouped to reflect overall 'agreement' or 'disagreement'.

The neutral response served the sole purpose of allowing a distinction to be made between those with strong opinions on an issue (whether agree or disagree) and those with no opinion (i.e. assumed to be impartial or not interested enough to have an opinion). Although, this group may be important in decision-making, there was less emphasis on neutral responses in the research since the focus was on competing interests. However, some questions in the study assumed prior knowledge of waste management issues or technologies so the omission of a 'don't know' response may induce inaccuracies in the data. In instances where this occurred, the implications are discussed below.

Response rate and data inaccuracies

The response rate on the vast majority of questions was above 80%. In all cases the valid percentages (which excluded missing responses) were used to show the distribution of responses for each variable.

There were some limitations associated with a lower rate of response (i.e. 68% to 85%) on question two (Appendix B), which solicited participants' preference for 'waste management technologies'. This was the result of a large number of missing and incorrect responses (see Table 4.6). A number of respondents from the citizen group tended to rank technologies when they were required to rate on a preference scale of 1 to 5, where 1 reflected the technology with the most potential and 5 the least potential. In some instances, respondents from the citizen group felt they had insufficient knowledge to make valid judgements - this issue was also reflected in comments made by respondents from the key stakeholder group. Some key stakeholders (e.g. Government agencies) felt they could not comment on preferences at the local level or that their preferences at the national level were outlined in government documents.

Table 4.6: Missing and incorrect responses

Respondents' categories	Missing and incorrect responses	Valid responses
Local authority	4 – 12%	88 - 96% (n = 23 - 25)
Key stakeholder	0 – 41%	59 – 100% (n = 10 – 17)
Citizen groups	24 – 65%	35 – 76% (n = 6 – 13)

On closer examination (Table 4.7) the missing and incorrect responses are higher for the more advanced technologies (e.g. gasification, pyrolysis, plasma arc, autoclaving) and landfill, which reflect the difficulties some respondents had in answering the question. The figures for non-thermal technologies (e.g. composting, anaerobic digestion and mechanical biological treatment) were fairly consistent (15% - 17%) with the exception of landfill (22% - 25%). The missing and incorrect responses were fractionally higher for incineration (18% - 22%) compared to non thermal technologies, but lower than those for advanced technologies.

Table 4.7: Missing and incorrect responses on individual technologies

Technologies	Local level (%)	National level (%)
Composting	15	15
Anaerobic digestion	17	15
Mechanical biological treatment	17	17
Incineration	22	18
Gasification	28	23
Pyrolysis	27	20
Plasma arc	32	27
Autoclaving	28	25
Landfill	25	22

In some instances, the relatively low level of valid responses from citizen groups (35%) and key stakeholders (59%) in comparison to local authorities (88%) meant it was difficult to compare the central tendency of data across groups as the number of valid responses differed significantly. Hence there was a possibility that data on the overall preference for technologies (Table 4.7) was skewed towards the most represented group (i.e. local authorities in most instances). To some extent, an examination of group preferences may highlight the extent of the problem of missing data but the varying number of responses (on technologies) may also affect the magnitude of difference in opinions across groups. Hence, the data has to be interpreted with some level of caution as indicated in results (Chapter 6).

4.6.6: Approach to statistical analysis and data limitations

The analysis of questionnaires was exploratory, largely because of the non-parametric nature of the data. This meant there was no scope for normalising the data, and little possibility of making predictions about how, in repeated samples of equal size, a particular statistic would behave (i.e. how it would be distributed). A two-tier analysis incorporating descriptive and explanatory statistics was used to

measure the incidence and variation in participants' opinions and facilitated an exploration of data patterns and common associations to verify and augment results from the qualitative study.

The preliminary analysis explored each variable in the data set separately to consider the range and spread of values and to describe the pattern of responses overall and across groups. For each of the variables analysed, univariate descriptive statistics provided an overall picture of the data, and selected percentiles, where appropriate, summarised the range and distribution of the data for the various groups (i.e. local authorities, key stakeholders and citizen groups). A comparison of group responses on each variable was made to indicate what constitute a 'large' or 'small' value for selected summary statistics.

The secondary analysis applied non-parametric statistics to assess the significance of relationships revealed in the data. This provided an additional way of examining the data beyond looking at group behaviour and responses to attitudinal questions. The first statistic applied was the Kruskal-Wallis test, a one-way analysis of variance by ranks, which was used to determine the level of significance of any differences in participants' opinions. The test is considered appropriate for determining whether three or more independent groups are the same or different on some variable of interest (Chan and Walmsley 1997). It assesses the form of distribution between the sample and the population to determine whether any difference between the groups are significant (i.e. not occurring by chance) (Hettmansperger 1984; Lehmann 1975). The second statistic applied to the data was Spearman's rank coefficient (r_s), a non-parametric measure of correlation, used to assess the degree (or strength) of association between ranked data from different groups. This statistic identified a predictive relationship in the behaviour and attitude of different groups. For example, a local authority may feel composting has potential to be considered a waste policy option for its locality based on a strong association between the need to achieve high recycling/composting rates and a desire to gain public support. The Spearman's rank correlation coefficient was used because it has the capacity to pick up either concordant or discordant relationships, as opposed to, for example, Kendal's Tau (a similar non-parametric measure of correlation) that limits

associations to a difference in probability between concordant and discordant relationships (Embrechts *et al.* 1999).

Spearman's rank correlation coefficient identified a monotonic relationship between variables; that is where the variables either increase in values together reflecting perfect agreement ($r_s = +1$), or when one increases, the other decreases reflecting complete disagreement ($r_s = -1$). Both of these conditions infer significant (or strong) association (Conover 1999; Daniel 1978) giving a distribution of possible values between -1 and +1. A critical value for correlation was applied and this determined whether an association between two variables was significant. It was a challenge to apply the Spearman's rank coefficient to the sample (N=60) mainly because the tables of exact probability for the coefficient are available for $2 \leq N \leq 18$ (Franklin 1987; Lehmann 1975; De Jonge and Van Montfort 1972; Owen 1962). There were also numerous differences among many introductory statistics textbooks in the tables of critical values for r_s - a view also taken by Nijsse (1988) more than two decades ago. However, the problem was addressed using an approximation table by Zar (1972); an approach recommended by other researchers (e.g. Ramsey 1989; Njssee 1988; Franklin 1987) as appropriate for large sample sizes $N \leq 100$. A critical value of $r_s \geq 0.394$ was recommended for a sample size of 60 (though at a confidence level of 99.8%) and a critical value $r_s \geq 0.255$ is recommended for a sample size of 60 (though at a confidence level of 95%). For the purpose of this research a critical value of $r_s \geq 0.4$ with a confidence of 95% is adopted (i.e. $0.400 \leq r_s \leq \pm 1$ and $p \leq 0.05$).

It is important to note that a significant association between variables does not imply a causal relationship (or a linear relationship as with equivalent parametric statistics such as Pearson's correlation). Spearman's coefficient measures the association of ranks, rather than the association of the underlying variables, so correlations only ever offer a probable explanation of the relationship between variables, which are given meaning by confirming the relationship with qualitative data (Chapter 7). The disadvantage with non-parametric measures of statistical significance is that they make no assumptions about the distribution (or central tendency) of the data and use the ranks of the data, rather than its raw value to calculate the statistic. Consequently, as the tests does not make assumptions about the distribution (i.e. that it is linear

across the population) it is not considered as strong a statistical measure as equivalent parametric tests (e.g. one way ANOVA and Pearson's correlation coefficient). The problem is usually considered magnified for small samples ($N \leq 10$) or if the assumption for the corresponding parametric method (e.g. non-monotonic relationship) holds (Siegel 1988).

4.7: Conclusion

The collection and analysis of qualitative and quantitative data in a sequential analytical process provided key insights around emerging themes and revealed underlying values that defined participants' perceptions, attitudes and beliefs. Qualitative data identified the concerns (and values) of participants, while quantitative data revealed the level of disparity in responses by group affiliation (i.e. local authority, key stakeholder and citizen group). The use of statistical measures of association allowed for the exploration of important differences across groups that may have been missed without the sequential combination of methods.

Analysing, coding and integrating the qualitative and quantitative data was time consuming as it was often necessary to reconfigure the coding scheme as new themes emerged and links to other themes materialised. It was important to gain an understanding of the opinions and attitudes of participants, specifically where views diverge; so it was useful to return to discrete and topically bounded qualitative responses associated with significant findings rather than to the entire qualitative dataset. This allowed for some rationalisation and justification of differences across groups. There was some concern that response categories were already linked as a consequence of the coding strategy employed during the qualitative study. However, care was taken to apply statistical measures of association only to response categories collected in different sections and with different questions. Ultimately the mixed methods approach allows the researcher to gain an appreciation of the diverse views of individual groups.

Section 2 of the thesis presents the results from the qualitative and quantitative study (Chapter 5 and 6) and an interpretation of stakeholders' views and opinions, reflecting on the literature to gain an understanding of the different positions taken on waste issues and public involvement (Chapter 7).

Chapter 5: Perceptions of Waste Issues and Opinions on Public Involvement: Emerging Views

This chapter presents the results from the qualitative study based on data from 32 interviews. It identifies how waste issues are framed by different groups (i.e. industry experts, policy makers and interested and affected citizens). The results revealed complex relationships between different groups and how individuals perceive, act on and negotiate their interests in relation to waste policy and practice.

The soft system methodology approach (Chapter 4) provided a structure for capturing the main issues around the problem, the prevailing culture and politics, and the intervention itself (how to address the issues and the desirable/feasible changes). An analysis using NVivo allowed the interrogation of the data from many angles, while comparing the perspectives of different groups and individuals. Several categories and sub-categories of information emerged from the analysis, which were further explored to reveal themes or common threads across the categories (Table 5.1).

The emerging themes capture the context of the decision situation, providing evidence of participants' judgement, interest or position on waste management issues and public involvement. Selected quotations reveal the interests, judgement and motives behind participants' views and provide illuminating insights, particularly where there are differences in opinions. The views of both expert and citizen groups are included in the presentation of the results.

The categories and sub-categories of data emerging from the qualitative analysis are summarised in Table 6.1 and the emerging themes are presented in Tables 5.2 to 5.10.

Table 5.1: NVivo outputs from the qualitative analysis

Context for analysis	Interrogating the data	Categories and sub-categories	
The issues What are the issues expressed by stakeholder groups?	Who can be identified as owners of the issues (i.e. the different interests)? What are the different perceptive on the issues?		
	The requirements, needs and desires as it relates to current and future waste management policy and practice	Waste policy (and strategy) (Section 6.1; Table 6.2)	Defining policy options
			EFW incineration as a policy option
	Factors that influence or impact the way waste management matters are decided		Social responsibility
	Conflicts that exist as a result of the issues expressed by different stakeholder groups		Deliverability of waste strategies
		Waste solutions (Section 6.2; Table 6.3)	Waste management targets
			Choice and desirability of waste management technologies
			Planning approval for waste management facilities
The prevailing culture What are the motivations for stakeholders' actions in terms of cultural norms and emotions?	What are the formal and informal roles of stakeholders? What behaviour or norms are expected of stakeholders in certain roles? What are the ethics or values by which the behaviour of stakeholders are judged?		
	Historical perceptions (not necessarily misgivings) about waste management practice, policy and solutions	Stakeholders' priorities and judgement (Section 6.3; Table 6.5)	Knowledge and judgement in decision-making
			Technical and social priorities
	The opinions and perceptions of groups on achieving current/future national and international standards for waste management		Regulatory, environmental and economic imperatives
	The dynamics/issues in the relationship between experts and citizens on waste management issues		Public stance on waste management issues
	Conflicts regarding the motivation for stakeholder actions in terms of cultural norms and emotions		Public interest, values and concerns
The politics What is the disposition of power in the decision situation?	How is power expressed in the decision situation? What factors can be identified that signal power is possessed in the situation? How is power used, protected, defended, passed on, relinquished etc.? Can power structures be identified to show how different groups take deliberate action in pursuit of their interests/objectives?		
	The characteristics of the political situation that lead to accommodating, desirable and culturally feasible action	Political drivers (Section6.4; Table 6.6)	Public influence on the political process
	The opinions and beliefs of individuals regarding changes in power-based structures: i.e. - destructive power play in pursuit of 'self- interest' - accommodating different interests in pursuit of balance and harmony		Regulatory and institutional issues

Table 5.1 (continued): NVivo outputs from the qualitative analysis

Context for analysis	Interrogating the data	Categories and sub-categories	
	Conflicts as a result of power expressed by different groups at different stages in decision-making		Fiscal issues
The intervention What are the desirable / feasible changes within the context of the decision situation?	What are different groups' aspirations and desire for intervention? What are the characteristics of the issues that lead to desirable intervention: is the intervention considered feasible (i.e. practical)? How are different groups likely to assess (or judge) the success of the intervention?		
	What are the characteristics of the problem that affect how public involvement is perceived by different groups	Motivation and purpose of public involvement (Section 6.5; Table 6.7)	
		Level of public involvement (Section6.6; Table 6.8)	
	What are the opinions and attitudes of groups regarding public involvement, given the position/stance of those involved, their particular history and points of view	Approach to public involvement (Section 6.7; Table 6.9)	Methods for public involvement
	What are the desired methods of citizen involvement including opinions and perceptions of groups in relation to the acceptability of methods		Stakeholder and public representation
		Experience with deliberative and participatory methods (Section 6.8; Table 6.10)	

5.1: Waste policy and strategy

The findings established participants' views on the form of action necessary to improve the deliverability of waste management strategies. Implementing waste strategies that include EFW incineration is seen as a great challenge for local authorities, largely because of the poor image of EFW facilities. This has prompted calls for more clarity in the government's approach to waste management in national policy, where suggestions included establishing a more positive national policy towards EFW incineration as a source of energy production and a national statement outlining the health implications of EFW facilities.

While it was generally accepted that priority ought to be given to options at the top end of the waste hierarchy (e.g. reduce, reuse and recycling), there is much debate on who should take the lead on educating the public on the importance of waste reduction and recycling. Though participants felt the public ought to be educated on the need for all types of waste facilities, be it recycling or residual treatment technologies, there are calls for greater debate around the delivery mechanism for achieving landfill diversion and recycling targets (Table 5.2).

Table 5.2: The issues: waste policy (and strategy)

Categories	Emerging issue (potential action points)	Group (issue owner)	Themes
Defining policy options	Adopt a broad mix of technologies for residual waste treatment approved by central government	Key stakeholder	Deliverability of waste strategies
EFW as a policy option	Establish a more positive national policy towards incineration with energy recovery as a source of energy production	Key stakeholder	
	Establish a national statement on the health effects of incineration facilities	Local authority	
Social responsibility	Increase public education and awareness on waste reduction and recycling	Local authority	
Deliverability of waste strategies	Conduct independent assessments of local residual waste quantities for more accurate estimates of incineration capacities (e.g. plant size)	Key stakeholder and Citizen group	
	Develop the energy recovery potential from mechanical biological treatment (MBT)	Key stakeholder	
	Funding for waste management technologies and infrastructure	Key stakeholder	Stakeholder priorities

5.1.1: Defining policy options

There was a feeling among participants that there ought to be more clarity in the government's approach to waste management in national policy. For instance, participants from the key stakeholder group felt government ought to make its wishes more clear, in terms of identifying ***a broad mix of technologies***, while leaving the choice as to what blend of technologies to use in a particular locality to private sector operators:

> "...there ought to be national leadership on [the waste strategy] because without that local authorities are kind of left in a vacuum and have to feel their way around which causes confusion...the strategy...has to provide that national framework for every [local authority] to follow".
>
> *- External Affairs Officer, Waste Management Company*

However, there are different opinions in the citizen group, where one environmental lobby felt that the private sector operator should not be allowed to "dictate the waste policy to local authorities" since waste has become a lucrative business and private companies are more interested in financial gains than finding better solutions for local communities.

5.1.2: EFW incineration as a policy option

There was much discussion around whether EFW was inconsistent with sustainable waste management. A representative from a trade association felt that government ought to adopt ***a more positive policy towards EFW as a source of energy production*** in the UK. One waste management company felt EFW should be adopted where it is "inefficient or impractical" to pursue options at the top of the waste hierarchy; it was suggested this will provide the basis for local authorities to achieve greater public acceptance of EFW facilities.

The poor image of EFW incineration facilities was often associated with the public's perception of health risks, dust, noise, visual impacts and declining property prices. One environmental lobby group felt that incinerators take a long time to build and may prove to be a less financially attractive option to local authorities in the long-term. While most local authorities support EFW incineration as a policy option, some were concerned about the lack of public support. One felt that environmental lobby and community action groups have a deep rooted objection to EFW and are usually uncompromising in their opinion, so there will always be an impasse with these groups in instances where local authorities support EFW incineration as a policy option. It was argued the situation could be improved if government addressed the poor image of these facilities: one local authority suggested government establish ***a national statement on the health effects of incineration facilities***.

5.1.3: Social responsibility

There was some debate about how options at the top of the waste hierarchy could be given higher priority in waste management. Much of the discussion focused on whether national or local government should be responsible for educating the public on the need for waste facilities; be it recycling or residual treatment facilities. One participant from academia felt that central government should take responsibility for encouraging communities to take 'ownership' of the waste problem, using financial incentives to encourage more responsible behaviour.

Most participants from the citizen group felt it was important to reduce and recycle waste and one environmental lobby felt ***public education as a means to encourage***

responsible behaviour should have greater priority for local authorities. However, some local authorities felt they do not have the capacity to drive 'real change' in terms of correcting perceptions of waste facilities or encouraging householders to be responsible and reduce or recycle waste. One felt preventing waste by targeting product consumption is absolutely critical to developing a good waste strategy; while another suggested waste reduction ought to be directed at the national level, implying local authorities should not be tasked with this responsibility. Other local authorities felt there are inadequate funds to enact the necessary schemes for waste reduction and recycling and that there should be greater responsibility put on the commercial sector, which is better equipped to take action.

5.1.4: Deliverability of waste strategies

There was a general feeling that there ought to be more debate around the delivery mechanism established for achieving landfill diversion and recycling targets. Local authorities tasked with developing and implementing waste strategies felt they are "deliverable" if deemed sustainable, cost-effective and socially acceptable:

> "This requires [local authorities] to balance the priorities of experts and the community against cost, political and environmental issues".
>
> *- Head, Waste Management – Unitary Authority*

Key stakeholders mainly from the waste industry felt the delivery of the waste strategy was dependent on the ***availability of funding*** from central government as this determines what technologies are provided. One participant from an NGO felt government funding is not an overriding issue and suggested local authorities put greater priority on waste management so as to allocate the necessary resources to improve practice.

Participants debated the nature and size of waste facilities, particularly treatment plants, where one local authority suggested that while larger (i.e. central) facilities have benefits related to economies of scale, smaller (i.e. local) facilities are more flexible and better able to meet targets for higher levels of recycling. Some participants from the private sector and environmental groups felt that many local authorities are over-specifying capacity for dealing with residual waste because they

are basing it on unrealistic growth rates. One environmental lobby group felt that ***more independent assessments of the capacity for dealing with residual waste*** would uncover the potential of options besides EFW incineration. For instance, there was some support for mechanical biological treatment (MBT) among the citizen group, though some participants in the waste industry felt there is still a need to ***develop the energy recovery potential of MBT***.

5.2: Waste solutions

There were different aspirations for municipal waste management targets with two distinct proposals; one for high levels of recycling (e.g. 80%) and another for a more equitable balance between recycling and thermal treatment with energy recovery (e.g. 45% each). The deliverability of waste management technologies was debated in terms of its practicality, acceptability and ability to go through the planning system without delays. Participants relayed preferences for a wide range of waste management technologies including thermal treatment (EFW incineration, gasification, pyrolysis), non-thermal treatment (mechanical biological treatment, anaerobic digestion) and other technologies (e.g. landfill). The challenge however, appears to be adopting and implementing appropriate and acceptable technologies that demonstrate an equitable balance between regional and local needs (Table 5.3).

Table 5.3: The issues: waste solutions

Categories	Emerging issue (potential action points)	Group (issue owner)	Themes
Waste management targets	Aim for higher recycling rates (e.g. 80%)	Citizen group	Waste management targets
	Adopt a more equitable balance between recycling (e.g. 45%) and EFW incineration (e.g. 45%)	Key stakeholder	
	Adopt more recycling schemes that include source separation (i.e. kerbside recycling and collection of food waste from households)	Citizen group	Deliverability of waste strategies
Choice and desirability of waste management technologies	EFW incineration	Local authority, Key stakeholder and Citizen group	Waste treatment and disposal technologies
	Mechanical biological treatment	Key stakeholder and citizen group	
	Anaerobic digestion		
	Advanced thermal treatment (e.g. gasification and pyrolysis)	Local authority and Key stakeholder	
Planning approval for waste management facilities	Adopt a more equitable process for siting waste facilities (e.g. close to the point where waste is generated)	Key stakeholder	Deliverability of waste strategies
	Include sites for facilities in the waste strategy	Local authority	
	Waste contracts with limited flexibility potentially restricts recycling (length of waste contracts)	Citizen group	Stakeholder priorities

5.2.1: Waste management targets

There were concerns that waste management targets were not achievable or sustainable but largely reflect the aspirations of central government and local authorities. For example, a key stakeholder felt local authorities were setting 'unrealistic' targets that may be unachievable and create dissatisfaction within the public:

> "If local authorities are coming up with unrealistic targets based on certain aspirations, then they will have to deal with the impacts and de-motivating effects if they are not achieved".
>
> - *Manager, Waste Academic Association / Waste Consultant*

Others, mainly from the waste industry, felt recycling rates should be determined by available markets. One showed preference for ***'a more sensible mix, which would comprise 45% recycling, 45% thermal treatment with energy recovery'*** and 10% landfill.

In contrast, most participants in the citizen group supported higher levels of recycling. One participant felt local authorities are aiming to meet their statutory minimum recycling targets and are not being ambitious enough compared to Flanders and Denmark. Others felt local authorities ought to be aiming for higher targets. For instance, an environmental lobby group felt ***'a more ambitious target of 80% recycling'*** could be achieved on the basis that it demonstrates more efficient resource use:

> "There are tangible benefits to recycling, not just a percentage benefit...with kerbside schemes you can recycle locally and get a cleaner feedstock which generates business, particularly if the use of virgin materials is replaced".
>
> - *Founder and Member, Environmental Campaign Group on Waste*

Conversely, a participant from the waste industry suggested recycling is likely to plateau out around 35-40% because higher percentages require operators to take lighter material which is uneconomical, considering the high fines associated with the Landfill Allowance Trading Scheme (LATS).

There was much debate around the infrastructure needed to achieve higher recycling. In terms of waste collection schemes, an environmental lobby showed support for ***source separation at household***, while a local authority proposed a factory-type sorting system on the basis that 'it is more cost-effective than kerbside sorting, which is labour intensive'. Other local authorities were not supportive of kerbside recycling schemes and one suggested stringent enforcement measures such as compulsory recycling should be adopted to improve recycling rates.

A participant from the waste industry proposed an integrated waste management system that shows some flexibility in technology application is the way to approach the targets imposed by central government. However, emphasis is placed on maximising waste minimisation and recycling before selecting a technology to treat residual waste.

5.2.2: Choice and desirability of waste management technologies

Participants raised a range of issues surrounding technological solutions to the waste management problem. Some key stakeholders (government agency and waste industry representatives) were unclear about the future role of landfill. One participant from the waste industry felt that this will ultimately determine the extent to which other options are taken on because the real driver to find alternative waste solutions is the cost of landfill. On the other hand, there were suggestions from the citizen group that local authorities need to be more open in giving a balanced reflection of the choice of technologies to engage the public and avoid opposition to waste facilities.

There was also debate around the practicality and reliability of a range of residual waste treatment technologies. A participant from a government agency felt that for the first time there are visible links between waste and climate change which should now drive forward renewable energy technologies. In terms of the reliability of technologies, a participant from the waste industry felt that ***EFW incineration*** is proven but there is much less experience in the UK with emerging technologies like ***gasification*** and ***pyrolysis***. On the other hand, some participants in the citizen group were more concerned with the impact that EFW facilities would have on recycling rates.

Some participants in the key stakeholder group felt funding from central government is a problem for local authorities because it ultimately determines whether they are able to deliver the strategy. A participant from industry felt that achieving the correct balance between EFW incineration and ***MBT*** is difficult for local authorities because it is affected by the availability of markets for recyclables. Table 5.4 summarises participants' comments around the advantage and disadvantage of technologies for residual waste treatment.

Table 5.4: Residual waste treatment technologies

Waste management technology	Advantages	Disadvantages
EFW Incineration	Long history of operation in the UK Upgraded and more efficient Local expertise available for operation and maintenance Suitable for municipal solid waste Reliable technology Potential for producing combined heat and power Environmental impacts are known - i.e. less risks (though the extent of health impacts are controversial) Cost-effective Easy to achieve compliance to LATS Easy to secure funding	Controversial issues surrounding the extent of impacts to human health Commonly perceived to produce high levels of emissions, associated with dust, noise and other nuisances Large amount of heat energy wasted at some facilities Prone to long term contracts that potentially restricts recycling Very unpopular among the general public and residents in the community
Mechanical biological treatment (and similar issues associated with anaerobic digestion)	Considered publicly acceptable because they are seen as 'new', 'cutting edge' and 'cleaner' Emerging information on good practice for operation and maintenance Defra's demonstration programme is building confidence in industry Potential to increase recycling or composting rates Easy to gain public support Easy to gain political support	High risks associated with unknown outputs Limited experience of operation in the UK Low potential for energy recovery from MBT (due to lack of local expertise) Higher costs (compared to incineration) Not likely to comply with LATS without thermal treatment Difficult to secure funding
Advance thermal treatment (e.g. gasification, pyrolysis)	Considered publicly acceptable because they are seen as 'new', 'cutting edge' and 'cleaner' Easy to gain political support Emerging information on operation and maintenance Defra's demonstrative programmes is building confidence in industry	Limited experience of operation in the UK Higher costs (compared to incineration) Not likely to comply with LATS High risks associated with unknown outputs Difficult to secure funding

5.2.3: Planning approval for waste management facilities

Participants across the waste industry felt a large number (and range) of waste facilities (i.e. '500 across England'; '2000 across the UK' in the next 3-5 years) will

be required to replace landfill. A government agency representative felt that a planning regime that will sustain this pace of development is crucial.

While a widely distributed range of treatment facilities was suggested there were concerns about public acceptance of these facilities, with one local authority suggesting this determined whether local authorities will meet imminent targets for landfill diversion:

> "Even with MBT, we need residual treatment technologies to meet the 2013 targets...it is almost inevitable that any major treatment facility will go to public inquiry which creates significant delays in the planning process".
>
> *- Head, Sustainability Unit – Unitary Authority*

There were similar opinions in the key stakeholder and citizen group, where a local community action group suggested ***a more equitable process for siting waste facilities*** is needed to improve the planning situation and avoid public opposition to waste facilities. Similar suggestions from local authorities implied the planning situation could also be improved if ***sites were included in the strategy*** to reduce siting controversy.

Other opinions from the key stakeholder group suggest reducing ***the length of contracts for waste facilities***, particularly EFW plants, may reduce public opposition and improve the planning situation. There were concerns (mainly from the citizen group) that the long-term disposal contracts for EFW facilities tend to have limited operational flexibility over its contract period which potentially restricts recycling.

5.3: Stakeholder judgement and priorities

The importance of expert and local knowledge to waste management decision-making was debated. Purely objective analysis was supported on the basis that it mediates 'emotive' disputes and controversy around waste treatment facilities. On the other hand, a desire to capture public perception of impacts from waste facilities, alongside more objective analysis that addresses questions of technological risks,

and environmental and social impacts was expressed. The challenge appears to be finding an equitable and fair approach to integrate technical and social data.

The motives and priorities of stakeholders in relation to waste management practice differed across groups. While compliance to statutory targets and protection of the local and national environment are seen as priorities for local authorities; the avoidance of local environmental impacts (e.g. traffic movements and emissions from facilities) and amenity impacts (e.g. visual and socio-economic impacts) are seen as priorities for communities and the general public (Table 5.5).

Table 5.5: The prevailing culture: stakeholder priorities and judgement

Categories	Emerging views (potential action points)	Group (issue owner)	Themes
Knowledge and judgement in decision-making	Expertise or technical knowledge	Key stakeholder and Citizen group	Relevance of knowledge in decision-making
	Knowledge of political or institutional frameworks (procedural knowledge)		
	Knowledge of the locality or community	Local authority	
Technical and social priorities	Landfill diversion targets	Local authority and Key stakeholder group	Stakeholder priorities
	Recycling targets		
	Cost-effectiveness of waste solutions		
	Funding		
	Local environmental impacts		
Regulatory, environmental and economic imperatives	National environmental impacts		
Public stance on waste management issues	Public satisfaction with the efficiency or cost-effectiveness of service		
Public interests, values and concerns	Public acceptance of waste facilities		

5.3.1: Knowledge and judgement in decision-making

There was support (mainly from the key stakeholder and local authority groups) for ***objective discussion*** of stakeholder priorities during decision-making as this is seen as a means of mediating disputes and controversy over waste treatment technologies. A participant from the key stakeholder group felt objective methods such as life cycle analysis (LCA) and cost benefit analysis (CBA) address questions of technological risks, environmental and social impacts and provides a basis for making decisions in the interest of communities instead of individual fractions of the community.

Citizen groups felt local authorities (and experts) tend to disregard the opinion of ordinary citizens as uninformed and irrelevant to the debate, largely on the basis that waste management is a complex issue that ought to be discussed among those with the necessary ***technical expertise (and political and institutional knowledge)***. In contrast, a local authority suggested the localised nature of impacts from waste facilities necessitates both technical judgement and ***local knowledge***. A government representative agreed suggesting that technical and social analysis of the impacts from waste facilities ought to be integrated to encourage public acceptance and understanding of risk assessments:

> "It is no good pretending a view can be taken on environmental or health risk without considering the social context because that affects whether the public is willing to accept the assessment of risks or whether they even understand it".
>
> *- Head, Waste Regulation Policy Unit, Government Agency*

5.3.2: Technical and social priorities

Participants had different views of priorities for developing 'deliverable' and sustainable waste strategies. Some local authorities felt the most important factor is developing a strategy that is sustainable over several years but say this is often difficult to achieve with pressure from LATS and local politics. One local authority felt that the deliverability of a waste strategy is not limited to meeting targets and ***wider environmental and economic goals***. It also has to be a strategy that would encourage the public to 'own, buy into and participate'.

It was suggested that poorly developed strategies have a negative impact on the planning process and are a result of the 'major political dilemma' that the waste industry faces when implementing waste strategies. For instance, a participant from the key stakeholder group felt waste strategies are required to address sustainability principles such as self-sufficiency and proximity but most fail to assess the deliverability (e.g. ***technical viability*** and ***public acceptability***) of the strategy which is equally, if not more, important.

5.3.3: Regulatory, environmental and economic imperatives

There was a general feeling that with potentially contentious technologies such as EFW, local authorities need to be honest and candid with the public in terms of their motives, priorities and how they make their judgement. This is particularly relevant where local and national priorities are negotiated during the development of waste strategies. For instance, a key stakeholder felt it is often not made clear that government, by building EFW plants within local communities, may be prioritizing national benefits (from avoided CO_2 emissions) over local benefits (avoiding local emissions which potentially could have negative implications for human health).

Most local authorities prioritize ***landfill diversion targets***, ***statutory recycling targets*** and ***costs of solutions*** (i.e. related to ***available funding***) over ***local and national environmental benefits*** and ***public satisfaction***. Some participants from industry felt that the main priority for residents is an ***efficient and cost-effective service*** and that some citizens prioritize ***health and local environmental impacts*** only if they live near waste facilities. Some local authorities felt targets could be achieved more quickly by concentrating efforts on large cities that produce more waste. One local authority felt this is not a straightforward decision to make and that it requires an assessment of costs among other factors.

5.3.4: Public stance on waste management issues

Participants generally felt that the public's stance on waste issues is related to personal experiences or concerns associated with perceived risks and social impacts from waste facilities. Participants (mainly local authorities) tend to put the public into various categories according to their interests and positions on waste management. For example, some are seen as uncompromising and radical in the position they take on EFW incineration.

A stakeholder engagement facilitator felt it may only be possible to actively engage environmental campaign groups 'if they are more open to listening and involving themselves in discussions'. Others in the local authority and key stakeholder groups were more optimistic about the ability to debate with environmental campaign groups. There was a feeling mainly among local authorities that the position of

'middle ground' groups can be further stratified according to whether they are directly or indirectly affected by waste facilities.

5.3.5: Public interests, values and concerns

There are different opinions about public concerns. Some of the issues that featured frequently across all groups include a number of local impacts such as ***traffic movements and emissions from landfill and EFW facilities, visual and socio-economic impacts*** (e.g. devalued property prices), and ***pollution from poorly operated waste facilities***, which affect public perception of waste facilities, particularly EFW facilities:

> "When we moved to this place I thought "surely a Council wouldn't build an incinerator if they thought it was bad for the community"... But [that] incinerator was responsible for one of the largest pollution incidents in this country. Now I question everything they tell me...I don't trust the 'so-called experts'".
>
> *- Founder and Member, Environmental Campaign Group on Waste*

A local authority representative argued that public engagement and education is important so that there is greater understanding and acceptance of the need for treatment facilities. However, a participant from the private sector felt engaging the public on waste management issues is difficult because of the lack of public interest in waste.

5.4: Political drivers

The prevalence of politics in decision-making is apparent in positions taken on controversial technologies such as EFW incineration. While this may be a response to public opposition to EFW facilities, the tendency of some politicians to exclude it as a policy option is seen as 'dogmatic' in approach and counterproductive to developing appropriate solutions to the waste problem (Table 5.6).

Table 5.6: The politics: political drivers

Categories	Emerging views (potential action points)	Group (issue owner)	Themes
Public influence	Political support for the waste policy or technology	Local authorities	Stakeholder priorities
	Planning approval to avoid delays in implementing facilities		
Regulatory and institutional issues	Politicians to make long term strategic decisions that last over the lifetime of several local authority administrations	Citizen group	Deliverability of waste strategies
Fiscal issues	Introduce variable charging for waste not recycled by householders	Key stakeholder	Deliverability of waste strategies

5.4.1: Public influence

Participants (mainly from local authorities) discussed the tendency of politicians to 'avoid hard decisions' reflecting on the need to gain ***political support*** of the waste policy or technology and ***planning approval*** to avoid delays in implementing facilities. Some felt politicians do not want to be unpopular and so are driven to adopt waste solutions that are acceptable to local people but do not necessarily provide a solution to the waste management problem. For example, one local authority representative explained that its 'no incineration policy' was adopted on the basis of 'political' opinion rather than being objectively informed. The representative of another local authority explained their 'no incineration' policy was adopted as the result of ferocious public opposition to a proposed large EFW incinerator facility.

5.4.2: Regulatory and institutional issues

One participant from the waste industry felt the imminent pressure of landfill diversion targets is driving politicians to be less 'dogmatic' in their approach. The issue of establishing sustainable (and deliverable) strategies was associated (mainly by citizen groups) with local authorities' ability to develop ***solutions that last over the lifetime of several local authority administrations***. One local authority suggested the Council ought to be more open and transparent about its position on EFW incineration, particularly if it supported (or put forward) this as a policy option.

5.4.3: Fiscal issues

Public reaction to financial incentives or taxes as a means to encourage responsible behaviour was debated. One participant from academia felt householders may be

encouraged to take ownership of waste facilities if ***financial incentives*** are implemented. However, a local authority participant argued that mainstream society is against financial incentives to stimulate behaviour change and used public reaction to the poll tax as an example:

> "You know the collective voice of the public can have a big impact as it did with the poll tax. They made huge changes and made the politicians sit up and take notice!"
>
> *- Waste Management Officer, Waste Collection Authority*

A member of a citizen panel felt tax levels restrict local authority funding and thus impose difficulties for resolving the waste management problem. However, a local authority participant suggested the general public are not willing to pay higher taxes for advancement in solutions to waste management problems: 'simplicity and cheapness' are what the public want.

5.5: Motivation and purpose of public involvement

Though much current guidance indicates a need for early public involvement, there still appears to be some debate on whether the public should be involved in decision-making at all. Most participants who acknowledge the need for public engagement suggested there are both negative and positive implications of early involvement (Table 5.7).

Table 5.7: The intervention: motivation and purpose for public involvement

Categories	Emerging views (potential action points)	Group (issue owner)	Themes
Motivation for public involvement	It is unlikely citizens could influence final decisions	Key stakeholder and local authority	Opinions on early public involvement
	It polarises opinions and provides an excuse for inaction	Key stakeholder	
	It is an opportunity to negotiate a workable, relatively fair solution that the vast majority can accept	Local authority	
	It reduces the level of opposition to waste facilities	Key stakeholder	
	It may create misunderstanding and misrepresentation of issues	Local authority	
	It provides a sense of 'real engagement' that enhances the political or democratic process	Citizen group	
	It is an antidote to traditional consultation methods that alienate participants		

Some participants (mainly from waste industry and local authorities) felt that while public opinion is usually considered in decision processes, ***it is unlikely that citizens could ever influence final decisions*** because ultimately the type of facility, its location and the general benefit to society need to be debated by experts and politicians.

There were conflicting opinions in the stakeholder group regarding the implications of early public involvement: one participant from the private sector suggested engaging the public on waste issues potentially ***polarize opinions and provide an excuse for inaction***; while a public engagement facilitator suggested engaging communities on the waste strategy ***reduced the level of opposition to siting waste facilities***. Other participants (mainly from local authorities) felt that involving citizens or 'non-experts' in complex decisions could ***create misunderstandings and misrepresentation of issues***.

The purpose and motives for public involvement were also debated. A local authority participant felt it is unrealistic to aim for consensus across all interested and affected parties and suggested the goal should be to '***negotiate a workable, relatively fair solution that the vast majority can accept***'. Some participants (mainly from the citizen group) felt that local authorities need to be more open and present a balanced reflection of the choice of technologies to achieve a sense of ***'real engagement'*** within the public, thus establishing trust and avoiding opposition to waste facilities. More deliberative and participatory methods are seen as an ***antidote to traditional consultation methods*** that alienate and frustrate participants.

A participant from a local environmental organisation felt 'the challenge is creating effective dialogue in a regulatory culture where participatory democracy is not the dominant ideology'. Others felt public involvement is 'the right thing to do' and is most beneficial when the right processes are set up for effective communication as this 'strengthens groups and avoids stand offs or impasses':

"There is a benefit if there is social input into the process – people are more likely to feel in control of waste management situations, instead of feeling the decision has been taken out of their hands".

- Head, Waste Services, Unitary Authority

5.6: Level of public involvement

There are different views about the level and form of public involvement implied by what waste industry and local authority representatives referred to as 'up front consultation' or early public involvement. The extent of public involvement was related to a range of factors such as the type of facility, cost of engagement and public interests (Table 5.8).

Table 5.8: The intervention: Level of public involvement

Categories	Emerging views (potential action points)	Group (issue owner)	Themes
Level of public involvement	Participate in problem definition	Key stakeholder and Citizen group	Extent of public involvement
	Participate in developing criteria for the evaluation of options		
	Consultation on short-listed options		
	Cost-effectiveness of public engagement	Local authority	Factors affecting the level of public involvement
	Public interest in waste management	Citizen group	
	Type of waste facility	Key stakeholder and Local authority	
	The local situation		
	Trust in expert opinion	Key stakeholder, Local authority and Citizen group	
	Public representation		
	Selection of consultees	Citizen group	
	Public stance on, knowledge and awareness of, waste issues	Key stakeholder and Local authority	
	Expertise on public engagement strategies	Key stakeholder, Local authority and Citizen group	
	Stage in the decision process		

The extent of public involvement (e.g. ***participation in problem definition, setting criteria to evaluate options and consultation on preferences among short-listed options***) varied in relation to stakeholders' opinions on the implications of early engagement. For instance, a stakeholder engagement facilitator felt it is important that option appraisal and the development of criteria made transparent so 'ready-made solutions' are not presented to the public; this encourages 'buy-in' or acceptance of the policy or technology. This was supported by the citizen group, where it was suggested that poor consultation is when local authorities 'involve the public after the options had been short-listed':

> "We were asked whether we would like incineration with MBT or just incineration – that was the extent of treatment options offered. It just was not proper consultation and most residents were disappointed".
>
> *- General Assistant, Local Action Group Against Incineration*

The findings suggest there are a range of factors affecting the level to which the public is engaged in decision-making. Some participants (mainly from local authorities) felt that up front consultation on the waste strategy is not always practical because to get ***good public representation is not cost-effective***. On the other hand, an environmental lobby felt any approach to selecting stakeholders and community groups should not limit representation from the range of people ***interested in waste*** and willing to participate, even though those in authority may feel their participation is not helpful to the process.

There was a feeling among most participants that the right level of public involvement depends on the ***type of facility and local situation***. A stakeholder engagement facilitator suggested a lot of the processes that local authorities run sit more on the consultation end of public involvement because they are seeking feedback on views or opinions, they tend to be public access not representative, but equally they are not opinion polls that seek people's views in the absence of information.

A participant from a local action group felt ***selecting consultees*** requires a good representation of local interest (i.e. the inclusion of ordinary residents from the community such as local parishes, ward councillors, individuals from local businesses and other organisations etc.). Participants from the local authority and key stakeholder group felt environmental lobby groups take an inflexible ***stance on waste issues*** that make engagement difficult. For instance, it was suggested that they (a) show interest only in contentious issues, (b) come along with their own agenda and, (c) are 'simply eco-warriors'.

In general, participants suggested the problems with more deliberative forms of engagement are: (a) they require ***expertise on public engagement strategies***, (b) they

are not accessible to the general public, (c) most are ***resource intensive*** (e.g. high in costs and time consuming), (d) there are difficulties in finding the right technique to deliver technical understanding without being patronizing to citizens, and (e) there is some scepticism about whether the public could ***overcome their mistrust of experts*** to engage fully on waste issues.

5.7: Approach to early public involvement

Participants had different views on how to select consultees, when to involve them and what methods/techniques to use for early public involvement. Some waste industry and local authority representatives felt that deliberative and participatory methods improve upon the traditional technocratic approach; although most acknowledge that both traditional and more innovative methods have a role to play (each with its advantages and disadvantages) (Table 5.9).

Table 5.9: The intervention: approach to early public involvement

Categories	Emerging views (potential action points)	Group (issue owner)	Themes
Methods for public involvement	Use a more structure approach to consultation in terms of a careful selection of consultees	Key stakeholder	Approach to early public involvement
	Consult a small group early and the general public after the strategy is developed	Local authority	
	Include local politicians early in the process	Local authority and Citizen group	
	Include the media early in the process	Key stakeholder	
	Employ an experienced and independent facilitator	Citizen group and Key stakeholder	
	Use electronic media such as blogs and email to involve the younger generation	Citizen group	
	Solicit ideas from the public on the types of activities and events to involve a wider group of people	Citizen group	
	Local authorities and citizens should jointly select experts or be able to put forward their own independent experts	Citizen group	
Stakeholder and public representation	Ensure the entire public is given a fair and equal opportunity to be involved	Citizen group	

5.7.1: Methods for public involvement

Several approaches for selecting consultees and the methods and techniques for early involvement were suggested. A participant from government felt a more ***structured approach to consultation, in terms of careful selection of consultees***, ensures that

input from stakeholders is relevant and taken seriously by authorities. A local authority suggested that ***consultation with a small group very early on and with the general public after the strategy*** has been developed might be a better approach as it is more cost-effective and encourages the public to take greater ownership of the waste problem.

Some local authorities and citizen groups suggested ***elected members (or councillors) should be engaged early in the process*** so they are included in discussions among stakeholders. A local authority participant felt that failure to engage elected members early in process mean that they could 'potentially undermine the process or disregard recommendations further down the line' which is counterproductive in the long term. Similarly, a participant from the waste industry felt the ***media should be engaged to improve accountability*** of the process.

A participant from a citizen panel felt it was important to ***employ an experienced and independent facilitator***' with the necessary communication skills and relevant knowledge of waste issues' to manage the process. A stakeholder engagement expert felt the role of the facilitator constantly changes throughout the process as citizens gain familiarity with the issue, implying there is a need to employ someone that is adaptable and flexible enough to respond to the needs of participants.

A member of a citizen panel felt young people (aged 24 and below) communicate through ***electronic media such as blogs or email*** so local authorities need to adopt such methods to capture their views. Others in the citizen group suggested ***ideas ought to be solicited from the public on how to consult*** to enhance the traditional consultation process.

5.7.2: Stakeholder and public representation

A local authority representative felt there should be a general framework for public consultation that local authorities can adapt to their local situation as this would allow some 'consistency in the approach adopted by local authorities and reduce potential conflict associated with public expectation'.

One local authority participant felt that public consultation on the waste strategy would benefit from a full representation of all parties involved in the process, specifically the waste contractor:

> "...we didn't do that at our meeting and the level of distrust around the contractor [who was unrepresented] came up a major issue. Now, this is an issue for our waste management department but it has a knock on effect on my ability to deliver the facility".
>
> - *Waste Planning Officer, Waste Disposal Authority*

An environmental lobby group felt any approach to selecting stakeholders and community groups ***ought not to limit representation from the range of people interested in waste and willing to participate***, even though those in authority may feel their participation is not helpful to the process. It was further suggested that ***experts ought to be selected by both local authorities and citizens*** to cover a wide range of issues around both technological and social impacts. A local environmental group suggest local authorities need to provide communities with the necessary resources to facilitate their participation in consultation:

> "The community does not have the resources and time of corporations so local authorities need to recognise, applaud and reward the people that are willing to give up their free time to get involved".
>
> - *Campaigner on Waste and Resources, Environmental Lobby Organisation*

5.8: Experiences with deliberative and participatory methods

Participants' experiences with deliberative and participatory methods revealed processes used to involve the public early in waste strategy development and facility planning. These showed a range of techniques used to engage and inform the public about waste management issues and confront critical trade-offs and consequences that are inherent in waste policy, technology and siting debates (Table 5.10).

Table 5.10: The intervention: experiences with deliberative and participatory methods

Categories	Emerging views (potential action points)	Group (issue owner)	Themes
Experiences with deliberative and participatory methods	Get residents to think about targets for recycling and preferences for different types of technologies and collection schemes	Local authority	Approach to early public involvement
	Give the public direction on the aims of the waste policy; educate them on types of technologies and associated environmental impacts before soliciting their opinion		
	Consult technical experts and a representative group of the public simultaneous, early in the process (i.e. in separate parallel sessions)		
	Use a combination of different methods (i.e. surveys and focus group) for consultation on the strategy and facility plans	Local authorities, key stakeholders and citizen groups	
	Use survey or opinion polls for consultation on the strategy and consensus panels or focus groups for consultation on facility plans		
	Use a select committee made up of residents, politicians, local authority officers and other stakeholders to discuss waste issues, gather evidence and jointly make decisions		

Box 1 summarises the views of a senior Waste Management Officer in North East England responsible for planning the review of the Council's 2004 Waste Management Strategy. The consultation process adopted a more deliberative and participatory approach consisting a technical review of the strategy and a series of three independent workshops with (1) statutory consultees and key stakeholder organisations, (2) policy makers and administrative officers and (3) a representative group of the public.

BOX 1: Consultation on the waste management strategy

*We got stakeholders and residents to think about **targets for recycling and preferences for different type of technologies and collection schemes**, and then we asked them what issues were important and used this information to identify the range of options.*

*Our **technical team** scored the options on a number of objective criteria and we presented these scores along with the more **subjective data from workshops** (e.g. perceptions regarding public health impacts, nuisances such as dust and noise etc.) in a report to our Executive.*

What most concerned officers were the optimistic targets that stakeholders and citizen groups set for waste minimisation.

Overall, it was difficult to adopt a methodology that combined the technical results and subjective data in a fair and equitable way.

Waste Strategy Development and Implementation Manager, North East England

Box 2 summarises the views of a Project Director for a waste management company, awarded the contract to develop three incinerators within a county district in East England. A stakeholder engagement consultant was employed to formulate three local community groups, one for each of the sites for the proposed facility, to discuss site-specific proposals and issues to be considered in the environmental impact assessment (EIA). The process included several workshops and site visits with presentations from the project team.

BOX 2: Community engagement on a facility proposal

During the planning application process, several ***community liaison groups*** *were established and input from residents changed some aspects of the architectural design of facilities and the routing of waste vehicles to the facility.*

... a lot of the issues were related to a previous incinerator on the site that discharged a lot of pollution – people didn't want to live through that again.

....One of the things we did was to take a mobile unit (a prototype of the facility) to the village hall to allow people to visualise the new plant. We did this before and after the planning application phase and our staff spent hours talking to people and responding to questions. We also attended a number of meetings arranged by the Council and other external bodies and also arranged site visits to an incinerator facility nearby.

Waste Management Contractor, East of England

Box 3 summarises the views of a member of a citizen advisory panel convened to develop a new waste management strategy for a unitary authority in South East England. The citizen advisory panel was established in 2005 and involved 20 citizens in a series of independently facilitated meetings, which called upon stakeholders and other interested parties to inform its view.

BOX 3: Consultation on the waste strategy

*I was involved to help the Council rewrite its policies for waste management. ...**we had to understand the strategic issues to be able to comment on their policy.***

***We were given talks by Defra and an opportunity to visit a recycling plant, composting plant and incinerator so we were well briefed on the options.** However, it was all very complicated - they are not simple solutions.*

*We were able to **consult the experts on issues arising out of our discussions** – usually a member of the group was tasked with going to the expert to get the information and then bring back the results to the group at the next meeting.*

I am a bit cynical about how much [the Citizens' Advisory Panel's report] will actually influence [the Council's] decision. Personally I think the Council had already made their decision before the consultation but they were very lucky because we came to the same conclusions that they had – though not because of their influence.

Member of Citizen Panel, South East England

5.9: Summary of results: key messages and themes

The data suggest that an over-reliance on expert knowledge as the basis for waste management decisions has the potential to stimulate greater objections to facilities and create delays in the planning process. There appears to be increasing local authority support for the use of deliberative and participatory methods, mainly at the facility planning level, which would allow citizens to negotiate interests with local authorities and, potentially, find an acceptable balance between regional needs and local impacts. However, there is some scepticism concerning the level of public involvement achievable, particularly during strategic planning, where the challenge is creating effective dialogue in a regulatory culture where participatory democracy is not the dominant political ideology.

Participants' experience with deliberative and participatory methods suggests it is difficult to combine regulatory/technical priorities with social objectives in a way that is fair and equitable to all parties. There was evidence to suggest early public involvement can be successful if local authorities show a willingness and commitment to change elements of the waste plan or proposal. Nevertheless, there is some scepticism around the extent to which citizens' recommendations will influence local authority decisions. One of the important messages reflected in the discussion with participants is that the right level of public involvement will depend on the type of facility and local situation.

Participants' judgement, interest and position on waste management and public involvement revealed nine key themes that highlight important issues around the research question:

- ***aspirations for national waste management targets*** – recycling and landfill diversion targets
- ***preferences for waste treatment and disposal technologies*** – choice of technology
- ***stakeholders' priorities for sustainable waste management*** – assessment of waste management technologies in terms of technical viability, affordability and social acceptability
- ***deliverability of waste strategies*** – actions needed to improve the deliverability of waste strategies and meet service delivery requirements
- ***relevance of knowledge in decision-making*** – the importance of different types of knowledge in decision-making (e.g. expert and local knowledge)
- ***opinions on public involvement*** – positive and negative implications of early public involvement
- ***factors affecting public involvement*** – issues affecting decisions on the mode and extent of public involvement
- ***extent of public involvement*** – the remit of the public and desired level of involvement in decision-making (i.e. during problem framing, criteria development or on short-listed options)
- ***approach to early public involvement*** – strategies for selecting consultees and methods/techniques for involving the public early in decision-making.

The next chapter describes trends in the data generated (from questionnaires) to arrive at a set of commonly held perceptions of the waste problem and opinions on public involvement, whether divergent or similar across different groups.

Chapter 6: Perceptions of Waste Issues and Opinions on Public Involvement: Data Trends

This chapter presents the results of the quantitative study based on data from 60 questionnaires. It establishes trends in the data and describes variations in perceptions of the waste problem and opinions on public involvement, across target groups (i.e. local authorities, key stakeholders and interested and affected citizens). The analysis identified the issues on which participants agreed and disagreed, and although participants who neither agreed nor disagreed on a particular issue were included (to illustrate the distribution of responses) this was not a focus for the research and thus not included in the analysis, as explained in the methodology (Chapter 4). A correlation analysis was conducted to measure the extent of association between variables and this is explored in Chapter 7.

The data reveals group responses to questions in keeping with the research focus. The added value of group responses is that their inclusion eliminates problems associated with an unequal sample size (e.g. skewed data). The resultant sample (N=60) was self-selected with a greater number of local authorities (n=26) represented compared to key stakeholders (n=17) and citizen groups (n=17). Nevertheless, statistical analysis that included an assessment of variance and correlation between variables (using SPSS) employed power calculations with adjustments built-in to deal with groups of unequal sample sizes.

This chapter summarises the incidence and variation in participants' opinions around a number of themes outlined in the previous chapter and concludes with a summary of results, outlining the more important issues for different groups.

6.1: National waste management targets

Respondents were asked what national targets English local authorities should achieve by 2020. Targets 1 to 7 (Table 6.1) were specified in the questionnaire to reflect the range of opinions from the interviews but respondents were also given the opportunity to select their own targets. . Each target reflects the proportion of municipal waste (expressed as a percentage of the total) that is recycled or

composted (RC); disposed to landfill (L); or had energy recovered through incineration (I); or some alternative technology not including incineration (NI).

Table 6.1: Group preference for specified targets

Waste management targets	Frequency distribution (N=60)	Local authorities (n=26)	Key stakeholders (n=17)	Citizen groups (n=17)
1: RC=10; L=70; I=0; NI=20	0%	0%	0%	0%
2: RC=20; L=20; I=60; NI=0	2%	0%	6%	0%
3: RC=31; L=58; I=11; NI=0	5%	4%	12%	0%
4: RC=45; L=10; I=0; NI=45	3%	4%	0%	6%
5: RC=45; L=10; I=45; NI=0	22%	32%	18%	12%
6: RC=70; L=5; I=0; NI=25	17%	8%	18%	29%
7: RC=95; L=5; I=0; NO=0	3%	0%	0%	12%

N/n = sample size

Though there is great disparity in preference for recycling or composting and landfill diversion targets, it should be understood that preferences reflect respondents' aspirations based on an estimate of what is deemed desirable or feasible in the future. As such it is expected there would be a significant gap between what groups (and individuals) consider plausible.

Table 6.1 shows group preferences for specified targets (Options 1 to 7) where 52% of responses were clustered. Generally the trends across groups reveal significant variability in preferences. The variation in group preferences for Option 5 (high levels of recycling/composting (≈ 70%) with some energy recovery not from EFW incineration (≈ 25%) and the remaining 5% to landfill) and Option 6 (an equitable balance between recycling/composting (≈ 45%) and energy recovery from EFW incineration (≈ 45%) with the remaining 10% to landfill). For instance, most citizen groups (29%) prefer Option 6 but fewer key stakeholders (18%) and local authorities (8%) show a similar preference. In contrast, most local authorities (32%) prefer Option 6 but fewer key stakeholders (18%) and citizen groups (12%) show a similar preference. While there is a clear distinction between citizen groups' preference for higher levels of recycling/composting and local authorities' preference for an equitable balance between recycling/composting and EFW incineration, there is no such distinction across the key stakeholder group.

6.2: Waste treatment and disposal technologies

A hierarchal order was established for waste management technologies. Respondents were asked to identify suitable technologies for handling residual waste (i.e. waste left after recycling and composting) in order of its potential to be situated at the local (town or city) or national (region or country) level. Technologies with the most and least potential are established, reflecting general preferences at both the local and national level, though opinions tend to differ across groups. This question had the lowest response rate (68% - 85%; n=41-51) due to a large number of missing and incorrect responses (see discussion on data limitations in Chapter 4).

Most respondents felt plasma arc and autoclaving (and also landfill, though not an advanced form of treatment) has least potential at either the local or national level (Table 6.2). There was a large number of missing and incorrect responses observed for these technologies (i.e. 22 – 32%) compared to, for example, composting and mechanical biological treatment (15% - 17%); which potentially skewed the data (see discussion on data limitations in Chapter 4). Nevertheless, the decision to solicit preference at both the national and local level is justified as there is a clear conceptual distinction that can be drawn between what technology participants are willing to accept (or champion) at the local and national level.

Table 6.2: Waste treatment and disposal technologies with most potential (by group)

Waste management targets	Frequency distribution (N=60)		Local authorities (n=26)		Key stakeholders (n=17)		Citizen groups (n=17)	
	National	Local	National	Local	National	Local	National	Local
Composting	60%	62%	80%	71%	59%	57%	67%	92%
Anaerobic digestion	55%	55%	52%	48%	77%	77%	78%	92%
Mechanical biological treatment	38%	33%	38%	29%	59%	62%	44%	39%
EFW incineration	48%	30%	75%	54%	47%	23%	38%	20%
Gasification	25%	13%	29%	21%	38%	25%	33%	0%
Pyrolysis	17%	12%	21%	17%	27%	18%	11%	11%
Plasma arc	7%	3%	8%	4%	14%	10%	0%	0%
Autoclaving	8%	7%	8%	13%	21%	10%	0%	0%
Landfill	8%	8%	13%	13%	6%	0%	13%	20%

N/n = sample size

Respondents from local authorities felt composting (80%), EFW incineration (75%) and, to a lesser extent, anaerobic digestion (52%) has most potential at the national level. There is a comparable level of potential for composting (71%) and anaerobic digestion (48%), but to a lesser extent, EFW incineration (54%) at the local level. However, fewer local authorities felt mechanical biological treatment has more potential at the national level (38%) compared to the local level (29%). Similarly, few felt gasification and pyrolysis has potential at the national level (29% and 21% respectively) compared to the local level (21% and 17% respectively).

The vast majority of respondents in the citizen group felt composting and anaerobic digestion (92% respectively) has most potential at the local level. However, comparatively fewer respondents felt these technologies have similar potential at the national level [i.e. anaerobic digestion (78%) and composting (67%)]. To a lesser extent, some respondents felt mechanical biological treatment has more potential at the national level (44%) compared to local level (39%). Similarly, EFW incineration has more potential at the national level (38%) compared to the local level (20%). Although gasification was thought to have no potential at the local level, 33% of respondents thought it had potential at the national level. Pyrolysis was among the technologies considered to have the least potential, but a few (11%) felt it has some potential at both the local or national level.

Most key stakeholders felt that anaerobic digestion (77%), composting (59%) and mechanical biological treatment (59%) and, to a lesser extent, EFW incineration (47%) has the potential to be situated at the national level. There is a comparable level of potential for anaerobic digestion (77%), mechanical biological treatment (62%), composting (59%), but to a lesser extent, EFW Incineration (23%) at the local level. Comparatively fewer felt gasification and pyrolysis has potential at the national level (38% and 27% respectively) compared to the local level (25% and 18% respectively).

Overall, the data (Table 6.2) reveals some disparities in preferences across groups. The analysis of variance by rank shows the median test scores differs significantly on preference for EFW incineration at both the national ($p = 0.041$) and local ($p = 0.039$) levels. However, what is consistent across all groups is that EFW incineration

is considered to have more potential at the national level compared to the local level. Similarly, there is a greater level of agreement on other waste management technologies (i.e. where the median scores are approximately equal). For example, there is greater agreement on the potential of anaerobic digestion ($p = 0.933$) and composting ($p = 0.830$) at the local level. The trends in data and the possible reasons for agreements and disagreements between groups are explored in Chapter 7.

6.3: Stakeholder priorities

Respondents were asked to prioritise, in order of importance, a range of factors identified as key to assessing the potential of waste management technologies (Table 6.3). These factors cut across a range of values (e.g. environmental, regulatory, technical, political, institutional, social and financial issues), which are at the core of delivering a sustainable waste strategy. Reflecting the variation in priorities there are distinct differences in how groups view the importance of these values.

Table 6.3: Stakeholder priorities (by group)

Stakeholder priorities	Frequency distribution (N=60)		Local authorities (n=26)		Key stakeholders (n=17)		Citizen groups (n=17)	
	Most imp.	Least imp.	Most imp.	Least imp.	Most imp.	Least imp.	Most imp.	Least imp.
Local environmental impacts	79%	12%	80%	8%	63%	31%	94%	0%
National environmental impacts	66%	14%	52%	16%	71%	12%	81%	13%
Landfill diversion targets	74%	12%	89%	4%	73%	7%	50%	31%
Recycling targets	52%	18%	50%	15%	60%	7%	47%	33%
Cost effectiveness	47%	20%	63%	13%	50%	13%	20%	40%
Public satisfaction	44%	19%	46%	19%	14%	21%	71%	14%
Public acceptance	55%	14%	50%	12%	59%	24%	62%	8%
Political support	65%	15%	80%	8%	40%	33%	67%	8%
Funding	60%	14%	63%	13%	47%	13%	69%	15%
Length of waste contract	28%	40%	33%	33%	21%	43%	25%	50%
Planning approval	51%	28%	63%	8%	60%	33%	17%	58%

N/n = sample size; imp. = important

There is much greater priority given to regulatory targets, particularly fiscal ones such as the landfill diversion target, among those directly or indirectly responsible for compliance (89% of local authorities and 73% key stakeholders, compared with

50% of citizen groups). In comparison, fewer key stakeholders (60%), local authorities (50%) and citizen groups (47%) considered recycling targets a priority.

A greater level of priority is given to local environmental impacts by the vast majority of those directly affected by waste facilities (94% of citizen groups) and also those interfacing with residents in affected communities (80% of local authorities) compared with those that have more autonomy over the issue (63% key stakeholders felt it is important, while 31% felt it is of least importance). In comparison, there is some variability in group opinion regarding the importance of national environmental impacts (81% of citizen groups, 71% of key stakeholders and 52% of local authorities).

Most local authorities (80%) felt that it was important to secure political support for the waste policy or waste management technology. This was also popular among some citizen groups (67%). On the other hand, there was mixed opinions across the key stakeholder group (40% agreed compared with 33% who disagreed).

As might be expected, most citizen groups (71%) felt public satisfaction with the efficiency and cost-effectiveness of waste services is of high priority. Given the priority the majority of key stakeholders and local authorities placed on, for example, regulatory and environmental issues, it is not surprising that fewer of these groups prioritise public satisfaction (46% of local authorities and 14% of key stakeholders).

Other factors considered important (though of less priority than those above) are:

- ***Funding*** for waste management technologies and infrastructure (67% of citizens, 63% of local authorities compared with 47% of key stakeholders).
- ***Cost effectiveness*** - adequate financial benefits from the waste management system (63% of local authorities, 50% of key stakeholders compared with 20% of citizen groups).
- ***Planning approval*** - a democratic planning system that reduces delays inherent in planning facilities (63% of local authorities, 60% of key stakeholders compared with 17% of citizen groups).

An analysis of variance by ranks revealed significant differences of opinions between groups regarding planning approval ($p = 0.033$). The planning issue is considered of high importance to those tasked with delivering waste facilities (63% of local authorities and 60% of key stakeholders). On the other hand, 58% of citizen groups felt this was of least priority.

6.4: Deliverability of waste strategies

Respondents were asked about their level of agreement and disagreement with actions that may be taken to improve how waste strategies are delivered by local authorities. Table 6.4 shows the proportion of respondents (across groups) that agree or disagree with actions for improving the deliverability of waste strategies.

Table 6.4: Actions to improve the deliverability of waste strategies (by group)

Stakeholder priorities	Frequency distribution (N=60)		Local authorities (n=26)		Key stakeholders (n=17)		Citizen groups (n=17)	
	Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
Adopt acceptable mix of technologies	68%	8%	75%	4%	82%	12%	56%	13%
Positive policy for incineration with EFW	63%	22%	88%	0%	71%	18%	31%	63%
Education on reduction / recycling	92%	3%	92%	4%	100%	0%	88%	6%
Long term strategic decisions	77%	7%	92%	0%	88%	0%	50%	25%
Devolve decision-making	27%	32%	21%	42%	24%	35%	44%	19%
Establish sites in waste strategy	62%	15%	50%	25%	65%	6%	88%	13%
Variable charging for householders	47%	23%	44%	26%	56%	19%	53%	29%
Produce health statement on incineration	63%	13%	67%	17%	71%	6%	63%	19%
Develop EFW potential from MBT	48%	18%	46%	17%	63%	19%	50%	25%
Independently assess incineration capacity	43%	20%	48%	22%	47%	12%	44%	31%
Source separated recycling	73%	15%	64%	20%	71%	18%	94%	6%

N/n = sample size

It was widely recognised across groups (p = 1) that waste prevention (through reduced consumption), minimisation and recycling is an integral part of a good waste management strategy (all key stakeholders, 92% of local authorities and 88% of citizen groups). There are greater variations in the level of agreement for other actions. For instance, the majority of:

- citizen groups (94%) felt there should be more recycling schemes that include source separated material (e.g. at kerbside) and collection of food waste (71% of key stakeholder and 64% of local authorities agreed)
- local authorities (92%) and key stakeholders (88%) felt politicians ought to take long term strategic decisions that last over the lifetime of several local authority administrations (only 50% of the citizen group agreed).
- citizen groups (88%) felt sites should be included in the waste strategy (64% of key stakeholders and half (50%) of local authorities agreed)
- key stakeholders (82%) and local authorities (75%) felt a broad mix of residual waste treatment technologies, approved by government should be adopted (56% of citizen groups agreed)
- key stakeholders (82%), citizen groups (82%) and local authorities (70%) felt an equitable siting process should be adopted for waste facilities

On the other hand, there was significant differences in opinions (p = 0.001) regarding the need for a more positive national policy towards EFW incineration as a source of energy production (88% of local authorities and 71% of key stakeholders agreed, while 63% of citizen groups disagreed).

Devolving decision-making on waste management issues from county to town level was seen by the majority of participants, particularly local authorities (42%) and key stakeholders (35%) as having the least potential to improve how waste strategies are delivered.

6.5: Relevance of knowledge in decision-making

Respondents were asked to identify the relative importance of different types of knowledge to waste management decision-making, largely to examine how people viewed the relevance of input from local authorities/politicians, experts and citizens

to the process (Table 6.5). Expert knowledge involves scientific, technical and socio-economic methods of analysis. On the other hand, local knowledge tends to be of a particular community or locality and may involve identifying social impacts associated with waste facilities. Procedural knowledge tends to be of due process, political, legal and institutional frameworks. Table 6.5 shows how groups viewed the relevance (or importance) of different types of knowledge.

Table 6.5: Relevance of knowledge (agreement by group)

Stakeholder priorities	Frequency distribution (N=60)		Local authorities (n=26)		Key stakeholders (n=17)		Citizen groups (n=17)	
	Waste strategy	Facility planning	Waste strategy	Facility planning	Waste strategy	Facility planning	Waste strategy	Facility planning
Expert knowledge	88%	87%	81%	81%	94%	88%	100%	100%
Procedural knowledge	67%	68%	77%	85%	71%	75%	50%	47%
Local knowledge	82%	88%	69%	85%	94%	94%	94%	93%

N/n = sample size

Expert knowledge is seen as important at both strategic and facility planning levels (81% - 100%). Local knowledge is considered equally important (by key stakeholders and citizen groups) at both strategic and facility planning levels (85 - 94%), though comparatively fewer local authorities (69%) felt it is as important at the facility planning stage.

There are also some differences in opinion regarding the importance of procedural knowledge at the strategic level ($p = 0.077$) but more significantly at the facility planning level ($p = 0.010$). The majority of local authorities and key stakeholders see the importance of procedural knowledge at all levels of decision-making (71% - 85%), but comparatively fewer citizen groups agreed (47% - 50%).

6.6: Opinions on early public involvement

A range of views on 'early public involvement' emerged from earlier interviews; several of which were used as the basis to assess and establish stakeholder opinions. There was some variation in opinions on early public involvement across groups (Table 6.6).

Table 6.6: Opinions on early public involvement (by group)

Stakeholder priorities	Frequency distribution (N=60)		Local authorities (n=26)		Key stakeholders (n=17)		Citizen groups (n=17)	
	Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
Fair solution	77%	5%	76%	8%	88%	6%	81%	13%
Public confusion	32%	50%	33%	42%	41%	53%	24%	65%
Joint ownership	65%	10%	68%	16%	69%	0%	65%	12%
Polarisation and inaction	35%	42%	25%	54%	50%	44%	41%	29%
Real engagement	67%	7%	68%	8%	88%	6%	53%	6%
Citizen empowerment	35%	18%	50%	21%	33%	13%	25%	25%
Expert/public remit	35%	45%	28%	48%	35%	41%	47%	47%

N/n = sample size

There is wide agreement on the benefits of early public involvement across all groups, although opinions varied (not significantly, $p = 0.136$) on whether early involvement gives the public a sense of 'real engagement'.

- ***Fair solution*** - it offers opportunities for a fair solution: key stakeholders (88%); citizen groups (81%); local authorities (76%).
- ***Joint ownership*** - it encourages joint ownership of the waste problem: key stakeholders (69%); local authorities (68%); citizen groups (65%)
- ***Real engagement*** - it gives the public a feeling of 'real engagement': key stakeholders (88%); local authorities (68%); citizen groups (53%)

There were greater variations in the level of agreement on negative implications of early public involvement. For instance, few local authorities (33%) felt that early public involvement potentially polarises opinions and provide an excuse for local authorities not to take action; however, 65% of citizen groups and 53% of key stakeholders disagreed.

6.7: Factors affecting the level of public involvement

Respondents were asked to identify what factors most influence the level to which citizens are involved in decision-making. Generally there are variations in opinions on factors that appear to have the least influence (see Table 6.7).

Table 6.7: Factors affecting the level of public involvement (by group)

Stakeholder priorities	Frequency distribution (N=60)		Local authorities (n=26)		Key stakeholders (n=17)		Citizen groups (n=17)	
	Most imp.	Least imp.	Most imp.	Least imp.	Most imp.	Least imp.	Most imp.	Least imp.
Type of waste facility	75%	10%	75%	13%	80%	7%	88%	12%
The local situation	77%	3%	79%	8%	81%	0%	93%	0%
Trust in expert opinion	45%	22%	36%	36%	67%	13%	60%	20%
Cost of engagement	25%	32%	14%	55%	38%	31%	43%	14%
Selection of consultees	37%	27%	22%	44%	53%	20%	69%	23%
Expertise on engagement	42%	23%	36%	32%	63%	6%	44%	38%
Public stance on waste	47%	17%	57%	17%	60%	27%	46%	15%
Public interest	45%	22%	42%	29%	67%	20%	54%	23%
Public knowledge	42%	20%	46%	27%	67%	13%	36%	29%
Stage in decision process	55%	12%	57%	13%	75%	0%	53%	27%

N/n = sample size; imp. = important

There is wide agreement across groups about the two most important factors affecting public involvement:

- ***the local situation***: 93% of citizen groups, 81% of key stakeholders and 79% of local authorities
- ***type of waste facility***: 88% of citizen groups, 80% of key stakeholders and 75% of local authorities

Most key stakeholders (67%) felt the level of public knowledge and interest influences the extent to which citizens are involved in decision-making with little difference in opinion across groups ($p = 0.946 - 0.956$). A greater number of key stakeholders (75%) felt the stage of the decision process is important in determining the level of engagement but most local authorities (57%) and citizen groups (53%) also agreed and only 27% of the citizen groups disagreed.

Most citizen groups (69%) felt the decision on who is selected to represent local residents and general public interests is important and comparatively fewer local authorities (44%) disagreed. The data shows that over half of local authorities (55%) felt the cost of engagement (i.e. the added cost, time and resources required for early public involvement) has least impact on the level of public involvement.

A number of key stakeholders (63%) felt the necessary expertise and experience on appropriate strategies and techniques for public involvement impacts on the level of

engagement. In contrast, comparatively fewer felt this was not an important issue (38% of citizen groups and 32% of local authorities).

6.8: Extent of public involvement

Respondents were asked to indicate the level to which they supported different strategies for early public involvement. Across groups, there were variation in preferences for how citizens should be engaged at all levels of decision-making (Table 6.8).

Table 6.8: Strategies for public involvement (agreement by group)

Stakeholder priorities	Frequency distribution (N=60)		Local authorities (n=26)		Key stakeholders (n=17)		Citizen groups (n=17)	
	Waste strategy	Facility planning	Waste strategy	Facility planning	Waste strategy	Facility planning	Waste strategy	Facility planning
Part of problem definition	53%	43%	42%	31%	50%	40%	77%	75%
Part of criteria development	38%	38%	31%	31%	38%	33%	53%	63%
Consulted on short-listed options	78%	63%	73%	59%	75%	73%	94%	93%

N/n = sample size

The majority of citizen groups (94%), key stakeholders (75%) and local authorities (73%) felt that citizens ought to be consulted on a range of short-listed options, particularly at the strategic planning stage. Although there was similar support for public consultation at the facility planning stage, comparatively fewer local authorities (59%) agreed. Similarly, citizen involvement in the development of evaluation criteria has less support at both strategic and facility planning stages across all groups (31 – 38%).

Most respondents from the citizen group felt the public ought to be involved in problem definition at both the strategic (77%) and facility (75%) planning stage. However, there was less support across the key stakeholder and local authority groups (31 – 50%), reflecting significant differences in opinion at the strategic level ($p = 0.036$).

6.9: Approach to selecting and involving consultees

Respondents were asked what approaches are more desirable for selecting consultees and at what stage should they be involved in decision-making. Preference for selecting and involving consultees varied across groups (Table 6.9).

Table 6.9: Techniques for selecting and involving consultees (by group)

Stakeholder priorities	Frequency distribution (N=60)		Local authorities (n=26)		Key stakeholders (n=17)		Citizen groups (n=17)	
	Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
Consult small then larger group	43%	38%	58%	39%	38%	31%	29%	47%
Consult public and experts together	58%	8%	46%	13%	88%	0%	59%	12%
Equal rights for public to participate	58%	10%	54%	21%	60%	0%	81%	6%
Involve politicians early	78%	5%	92%	4%	88%	0%	59%	12%
Involve the media early	67%	8%	73%	8%	75%	6%	53%	12%
Careful selection of consultees	50%	18%	52%	12%	56%	13%	47%	35%
Community liaison groups	87%	2%	85%	0%	94%	0%	88%	6%

N/n = sample size

The large majority of key stakeholders (94%), citizen groups (88%) and local authorities (85%) felt community liaison groups with local residents during facility planning and construction was desirable. There is much wider demand for involving politicians and the media across key stakeholder and local authority groups (73 – 92%) than citizen groups (53 – 59%). In all cases, there was greater support for involving politicians in the consultation process. The majority of key stakeholders (88%) felt technical experts and a representative group of the public ought to be consulted simultaneously, early in the process (e.g. in seperate parrallel sessions). There was less support for this across the citizen group (59%) and local authority group (46%).

The majority of citizen groups (81%) felt the general public should be given a fair and equal opportunity to be involved in all decision-making. There was less support

for this across the key stakeholders (60%) and local authority (54%) groups, where few (52 – 56%) felt a more careful selection of consultees, ensures that input from stakeholders is relevant and taken seriously by authorities. Similarly, consulting a small group of stakeholders early in the process and then the general public after the strategy is developed is most desirable for local authorities (58%) but undesirable for citizen groups (47%).

6.10: Methods for 'early' public involvement

Respondents were asked what methods are desirable for involving the public early in decision-making. Preferences for the level and methods of public involvement varied across groups (Table 6.10).

Table 6.10: Level and methods for public involvement (by group)

Stakeholder priorities	Frequency distribution (N=60)		Local authorities (n=26)		Key stakeholders (n=17)		Citizen groups (n=17)	
	Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
Engage community in setting targets	62%	15%	52%	24%	75%	13%	86%	7%
Educate public then engage in debate	87%	2%	81%	0%	100%	0%	94%	6%
Authorities and public to jointly select experts	30%	25%	16%	36%	44%	25%	41%	12%
Use joint select committee approach	53%	13%	50%	21%	63%	0%	59%	18%
Use different methods at each decision stage	55%	18%	56%	16%	69%	6%	50%	38%
Use combination of different methods	73%	0%	80%	0%	88%	0%	59%	0%
Use independent facilitators	70%	7%	78%	9%	81%	0%	73%	13%
Use modern methods to engage young people	63%	13%	58%	23%	67%	7%	77%	6%
Solicit public ideas on how to consult	67%	7%	63%	4%	81%	6%	71%	12%

N/n = sample size

The importance of educating the public before engaging them in debate was universally recognised (p = 1) across groups (i.e. 100% key stakeholders, 94% of citizen groups and 84% of local authorities).

Using a combination of methods (e.g. surveys, focus groups) for consultation is widely supported by key stakeholders (88%) and local authorities (80%), though there is comparatively less support across the citizen group (59%). Other desirable methods include (58 – 81%):

- soliciting ideas from the public on the types of activities and events to involve a wider group of people
- using alternative forms of communication such as online chat networks, email and blogs to involve the younger generation (under 24 years of age)

There are significant differences in opinions ($p=0.024$) regarding whether residents ought to be involved in setting targets for recycling and preference for different types of waste management technologies and collection schemes. Most citizen groups (86%) and key stakeholders (75%) agreed; while roughly half (i.e. 54%) of local authorities agreed and comparatively fewer (24%) disagreed.

There is wide acceptance of the need to employ independent and experienced facilitators when running participatory and deliberative events (81% of key stakeholders, 78% of local authorities and 73% of citizen groups).

6.11: Summary of results

The views and opinions of respondents on key issues of waste management and public involvement are established and summarised below. These are based on trends in the data set and reflect some of the issues for stakeholders in the waste sector. Hence, the data should not be interpreted as a comprehensive overview of the current waste management situation.

National waste management targets. Respondents' aspirations for landfill diversion and recycling targets reflect distinct views on what is likely to be achievable or sustainable in the future. There was a clear distinction in group preferences with the majority of local authorities supporting a more equitable balance between recycling/composting and energy recovery from incineration, while the majority of citizen groups supported higher levels of recycling/composting with no energy

recovery from incineration. On the other hand, there was division of preferences across the key stakeholder group, with equal support for the options identified above.

Preference for waste treatment and disposal technologies. A hierarchical order was established for technologies to handle waste left after recycling/composting. The data show some consistency in group preferences for non-thermal technologies (e.g. composting and anaerobic digestion) at the local level, while there was less consistency in support for EFW incineration at the local level. The distinctions in group preferences are summarised below:

- citizen groups preferred non-thermal technologies (e.g. composting and anaerobic digestion) mainly at the local level
- local authorities preferred composting and EFW incineration at the national level but showed less support for EFW incineration at the local level
- key stakeholders preferred anaerobic digestion, mechanical biological treatment and composting at the local and national level.

Stakeholder priorities. There were disparities in the priorities of individual groups, reflecting a clear distinction in the values of stakeholders in assessing the potential of waste management technologies. In rank order:

- local authorities prioritised landfill diversion targets, local environmental targets, political support, funding and planning approval
- citizen groups prioritised local environmental impacts, national environmental impacts, public satisfaction, funding and political support
- key stakeholders prioritised landfill diversion targets, national environmental impacts, local environmental impacts, recycling targets, planning approval, and public acceptance.

Deliverability of waste strategies. The actions prioritised by groups reflect prevalent views on policy and technological issues in the waste sector. Local authorities and key stakeholders felt that the actions most needed to improve the deliverability of waste strategies include public education on waste reduction and recycling, long term policy decisions that last over several local authority administrations and a mix of acceptable technologies for the treatment and disposal of residual waste. Key

stakeholders also identified the need for a more positive national policy on incineration (with EFW portrayed as a source of renewable energy), a national statement on the health implications of incineration and source-separated recycling to capture more green and inert waste. While citizen groups agreed with the latter and the need for more education on waste reduction and recycling, they also identified a need for sites to be included in waste strategies.

Relevance of knowledge in decision-making. The importance of different types of knowledge during strategic and facility planning was established, largely reflecting how groups viewed the relevance of input from local authority officials, politicians, experts and citizens at different stages of decision-making. Both local authorities and citizen groups felt expert knowledge was equally relevant during strategic and facility planning. However, local authorities felt local knowledge had more relevance at the facility stage, while citizen groups felt local knowledge has equal relevance during strategic and facility planning. On the other hand, key stakeholders felt expert knowledge was more relevant during strategic planning but recognises local knowledge to be equally relevant during strategic and facility planning. Most groups felt procedural knowledge was least relevant during strategic and facility planning, with the exception of local authorities, who felt it was at least as relevant as other types of knowledge during facility planning.

Opinions on early public involvement. There were several views regarding the positive and negative implications of early public involvement. There was general agreement across groups on the positive implications of early public involvement:

- a means to negotiate a workable, relatively fair solution that the vast majority of stakeholders can accept
- reduced opposition to waste facilities because citizens are encouraged to take joint ownership of the problem early in the process.

There was also some agreement among key stakeholder and local authority groups who felt early public involvement gives the public a feeling of real engagement and enhances the political or democratic process. In contrast, there was much

disagreement on the negative implications of early public involvement, with no clear distinction of views across the groups.

Factors affecting the level of public involvement. There were differing views regarding factors that affect the level to which citizens are involved in decision-making. There was wide agreement across groups on the two most important factors affecting public involvement:

- the local situation (e.g. the sensitivity of the locality, history of waste management practice and residents' opinions on waste facilities)
- the type of facility (i.e. whether it is contentious or not).

Other factors identified as important to respondents include the selection of consultees, public stance on waste management issues and the stage in the decision process i.e. strategic or facility planning.

Extent of public involvement. Support for public involvement differed depending on the stage of decision-making (i.e. strategic or facility planning). There was least support across the local authority and key stakeholder groups for engaging the public in developing criteria to evaluate waste management options, and marginally higher support for engaging them in defining the waste management problem. A similar position was adopted in the citizen groups, but there was much more support for these strategies compared to other groups. There was unanimous support for engaging citizens on a short-list of options after the strategy or facility proposal has been drafted.

Approach to selecting and involving consultees. Opinions on strategies for selecting consultees and involving them in decision-making were established. Key stakeholders and citizen groups felt establishing community liaison groups with local residents for ongoing consultation during facility planning and construction was important. Local authorities and key stakeholders felt it was also important to involve politicians and the media early in decision-making. Citizen groups felt it was also important to ensure the entire public is given a fair and equal opportunity to be involved in decision-making at the strategy and facility planning level, and that key

stakeholders, experts and a representative group of the public ought to be consulted simultaneously and early in the process.

Methods for early public involvement. Respondents identified a range of desirable methods for early public involvement. There was unanimous agreement on the need to educate the public before their engagement in debate. Local authorities and key stakeholders felt it was also important to use a combination of different methods (from information gathering to partnering approaches) for consultation on strategy and facility plans. In addition, local authorities felt it is important to use independent facilitators with the necessary expertise and experience for public engagement events. Key stakeholders felt it is important to solicit ideas from the public on how best to consult them, while citizen groups felt that residents ought to be consulted on waste management issues prior to identifying options.

The next chapter draws upon the qualitative data to rationalise the views and opinions of stakeholders. The combination of qualitative and quantitative data presented here and in Chapter 5 provides a rigorous approach to compare the views of groups and to gain a deeper understanding of their opinions and attitudes to waste management issues and public involvement.

Chapter 7: Public Involvement in Waste Management Decision-Making: Rationalising Stakeholder Views

This chapter establishes the findings from the research. It focuses on interpreting the views and opinions of stakeholders on municipal waste management issues and the potential for greater public involvement. The findings outline four themes identified in the correlation analysis and draw on trends in the questionnaire, information generated from interviews and the literature to gain an understanding of the opinions and attitudes of participants. Opinions and attitudes are explored (particularly where correlations are revealed) to rationalise and justify the differences across groups.

The statistical data are used, where relevant, to return to the qualitative data for the necessary evidence to rationalise and interpret responses from the questionnaire. The statistical data was also given meaning by confirming the patterns revealed with the qualitative data; thus verifying and augmenting the results of the quantitative study.

7.1: Priorities and preference for waste management technologies

The quantitative study revealed there is greater preference for technologies such as composting and anaerobic digestion, which may be attributed to the fact that there are now visible links between waste and climate change and current initiatives to increase the uptake of these technologies (Defra 2010; WRAP 2009). . The interview data revealed that most participants were cognisant of the need for waste facilities to meet government targets; however, some tended to identify and debate a range of concerns in relation to the impacts of technologies, particularly thermal treatment at the local level. These views are consistent with those reflected in the literature (e.g. Tunesi 2010; AEA 2009) and include, but are not limited to, potential impact on the environment and human health, public acceptability, operational reliability and economic viability of technologies, among a range of other concerns. The basis on which groups rationalise the choice of different technologies is discussed below.

7.1.1: Non-thermal technologies (biodegradable waste)

The perceived desirability of composting (92% of citizen groups, 71% of local authorities and 57% key stakeholders) and anaerobic digestion (92% of citizen

groups, 77% of key stakeholders and 48% of local authorities) at the local level suggests a preference for facilities to manage organic waste. The correlation analysis revealed a positive association between citizen groups' perception of the potential for composting and stakeholder priorities such as national environmental impacts. Interview data suggest support for these technologies (from citizen groups) is on the basis that it avoids controversial issues associated with siting EFW incineration facilities at the local level. Although there were no significant correlations revealed in how local authorities ranked these variables, interview data suggests some were concerned about residents' perception of social injustice and disparities in health impacts propagating to a national scale through the tendency for politicians to "avoid the hard decisions" and adopt technologies acceptable to the local people but not necessarily a better solution to the waste management problem.

There is less agreement on the potential of non-thermal technologies at the national level, where for instance, comparatively fewer citizen groups supported composting (67%) and anaerobic digestion (78%). Although the reasons are not entirely clear, some parallels are drawn with comments from local authorities and participants from industry to suggest waste facilities regardless of size and type, are unpopular among communities and require greater effort to engage citizens, particularly residents from host communities. Similar views are expressed in the literature (e.g. Coggins 2003; Cullen 2002. On several occasions, participants from citizen groups felt the business objectives of private sector operators are overriding goals associated with finding the best technologies for communities, potentially offering an additional reason for the lower levels of citizens' support for non-thermal technologies (situated at the national level). The literature suggests there are challenges associated with integrating facilities to recover energy from waste: selection of technology, the need for pre-treatment or off-site energy recovery, and the scale of plant for thermal treatment of wastes (Tunesi 2010; Defra 2007b).

7.1.2: Thermal technologies (including advance thermal treatment)

There is significant disparity in preferences ($p \leq 0.05$) for thermal technologies, specifically EFW incineration at the national level (75% of local authorities, 47% of key stakeholders and 38% of citizen groups) and local level (54% of local authorities, 23% of key stakeholders and 20% of citizen groups). The dichotomy of

views on the role of EFW incinerator facilities as part of an integrated municipal waste strategy (SLR Consulting 2005; ESA 2004) was evident in the data. For instance, EFW incineration was less desirable at the local level, which may be largely attributed to its controversial nature; particularly in relation to perceptions around environmental impacts, restrictions on direct recycling, public opposition to facilities and potential impacts on the planning process. On the other hand, the technology has more support at the national level, mainly from local authorities where there was positive correlation between their perception of the potential of EFW incineration and the importance of landfill diversion targets.

The interviews reveal a certain level of ambiguity implicit in debate around local authority priorities and goals for sustainable waste management; specifically in relation to thermal treatment options such as EFW incineration. For instance, landfill diversion targets are often prioritised because: (1) the financial implications are significant; (2) thermal treatment is identified as a viable option in situations where, the lifecycle impacts imply, it is inefficient or impractical to recycle and; (3) the hard-line environmental lobby, being wholly against EFW incineration, can take such a position because they do not have the responsibility to deliver waste strategies.

The first comment, by a local authority, implies landfill diversion targets take priority over recycling because of the associated financial penalties, confirming suggestions that Government's priorities are driving waste management towards the achievement of national targets and efficiency savings (Slater *et al.* 2007). However, since recycling is important to the public, it is equally an incentive for local authorities to recycle. The second comment, from a private sector representative, implies recycling is (or ought to be) pursued only up to the point where it is efficient and practical. Hence, the objective is not to pursue targets that satisfy stakeholder aspirations but to recycle to a feasible level and then recover energy, where EFW incineration is implicitly identified as the better option. Similar views (e.g. RTPI 2010) suggest priorities for waste management should be based on attainable targets such as efficient use of resources and minimal disposal. The third comment, from a local authority, states there is a section of the public that takes an inflexible position against EFW incineration and implies such opinions are 'privileged ones' than can

only be held by groups without the responsibility for delivering waste strategies. A number of similar comments suggest the public has an 'irrational' fear of EFW incineration, supports 'unrealistic' recycling rates (≥70%) and hold several misconceptions about the technology - all of which has to be addressed for the sake of implementing the necessary facilities in the current financial climate where economic benefit is a priority (CIWEM 2010).

These comments and a number of others reveal tension between the inflexible stance taken on EFW incineration by a public stereotyped as 'irrational and fearful' and 'unrealistic in their aspirations', and the view that landfill diversion (often through EFW incineration) is usually prioritised because of government targets and not on the basis that it is 'inefficient or impractical' to pursue higher levels of recycling. A private sector representative suggests a possible means of addressing this tension (and potentially improving the public profile of these facilities) is for local authorities to compromise on their business objectives and equip facilities with the necessary control mechanism to minimise local emissions.

The more advanced thermal treatment technologies were among those considered to have the least potential to be implemented at either the local and national level - e.g. gasification (22% of respondents at local level and 37% at the national level) and pyrolysis (27% of respondents at local level and 37% at the national level). Conclusions drawn from interviews suggests these technologies are seen as publicly acceptable because they appear to be 'new', 'cutting edge' and 'cleaner', thus avoiding local environmental issues commonly associated with EFW incineration. On the other hand, they are unpopular because they are seen to be higher in cost (compared to EFW incineration) and a riskier alternative since there is limited experience of operation in the UK. Nonetheless, there appears to be some potential for gasification at the national level as data trends show slightly higher support among respondents (38% of key stakeholders, 33% of citizen groups and 29% of local authorities). Although the reasons for this are not entirely clear, there was positive correlation between key stakeholders' perception of the potential of gasification and the importance of landfill diversion targets. Similarly there was positive correlation between local authorities' perception of the potential for gasification and the importance of recycling targets.

It is interesting to note that all forms of thermal treatment (e.g. incineration, gasification and pyrolysis) were consistently viewed as having less potential at the local level (Chapter 6). However, data trends show an inverse relationship to preference for non-thermal treatment (e.g. composting and anaerobic digestion) specifically across the citizen group. Potentially this confirms that the 'rooted objection of environmental lobby groups and communities to EFW incineration facilities' along with issues associated with the perceived health impacts of facilities, restrictions on direct recycling and planning approval is largely associated with consistently low levels of support for thermal facilities.

7.1.3: Other technologies

As with thermal technologies, there is some disparity (though not significant) in participants' perceptions of the potential of mechanical biological treatment at both the national level (59% of key stakeholders, 44% of citizen groups and 38% of local authorities) and local level (62% of key stakeholders, 39% of citizen groups and 29% of local authorities). Most notable is key stakeholders' perception of the potential for mechanical biological treatment, which had a negative correlation with public acceptance (at the local level) and positive correlation with funding (at the national level); suggesting funding to be an important variable for implementation at the national level, whereas there is an inverse relationship with public acceptance at the local level. From interviews, there was a feeling among participants (mainly from the waste industry) that while mechanical biological treatment has an increasing role to play, the lack of expertise to recover energy restricts support for the technology.

Issues regarding the complexity and reliability of mechanical biological treatment were further explored (mainly by industry experts) through discussions around operational issues, the energy recovery potential and risks associated with organic bi-products. Nevertheless the data show a moderate level of support for improving the energy recovery potential of the technology among the local authority and citizen groups (i.e. 46% of local authorities and 50% of citizen groups compared to 63% of key stakeholders) which corresponds with a lack of support for the implementation of the technology (at local and national levels) by both groups. The low levels of support for mechanical biological treatment among local authorities (i.e. 38% and 29% at the national and local levels respectively) can be contrasted to greater support

for EFW incineration, particularly at the national level (75% of local authorities). From interviews, it is evident that much of the support for EFW incineration is on the basis that it presents a more attractive option in terms of its energy recovery potential and savings associated with lower operational and maintenance costs. This is predominantly a local authority view that was negatively correlated with public acceptance (at the national level) and positively correlated with political support (at both national and local levels). This suggests some consistency with local authority concerns regarding public influence on political decisions, where it is evident (from interviews) that some environmental lobby groups champion mechanical biological treatment on the basis that it could lead to increases in recycling rates, unlike EFW incineration.

In the current climate of localism, where the focus is on community input, issues such as the selection of technology, the need for pre-treatment or off-site energy recovery, and the scale of plant for thermal treatment of wastes (Tunesi 2010; Defra 2007b) may be exacerbated so greater effort to support decision-makers needs is necessary, either in framing waste policy, or in taking site-specific decisions.

7.2: Priorities and actions to improve the deliverability of waste strategies

Several actions are identified for improving the deliverability of waste strategies. These include but are not limited to: greater social responsibility and awareness of the need for waste facilities; technically sound, viable and socially acceptable technologies; and a more depoliticised, democratic and socially engaging decision process. The general conclusion drawn from interviews is that there ought to be more debate around the delivery mechanism established, as part of the waste strategy, to implement waste facilities and meet service delivery requirements. This requires the waste management industry and the public sector to work closely together to produce a range of facilities that serve current and future needs, including those of local communities (Defra 2007). The basis on which different groups rationalise the benefits of actions to improve the deliverability of waste strategies are discussed below.

7.2.1: Social responsibility

There is wide acceptance (p = 1) of the need for householders to take 'ownership' of the waste problem and increase public education on waste reduction and recycling (100% of key stakeholders, 92% of local authorities and 88% of citizen groups agreed). This is consistent with the clear message arising from interviews on the need to target product consumption, whereby 'a coherent and publically acceptable waste strategy sets out operationally how the waste hierarchy options will be pursued in the short term'. These views are consistent with those in the literature, where it is suggested that waste policies ought to be aligned with production and consumption policy to create a more integrated policy framework (SITA 2010; RTPI 2010; CIWEM 2010).

However, much of the debate on this issue is focused on who should take responsibility for educating the public on the need for facilities and raise awareness on the importance of waste reduction and recycling. A participant from academia suggested financial incentives may force householders to take more ownership of the waste problem, and data trends showed a similar (though moderate) level of agreement across groups (56% of key stakeholders, 53% of citizen groups and 44% of local authorities agreed).

There was negative correlation between local authorities' preference for variable charging and the importance of cost-effectiveness, while there was positive correlation between key stakeholders' preference for variable charging and funding. From interviews, it is implicit from local authorities' opinions that there are concerns about the added financial and administrative costs associated with setting up waste minimisation schemes such as variable charging. The issue of inadequate funding to enact waste minimisation and recycling schemes was raised by some local authorities, consistent with the opinion that future responsibility for waste prevention should be with producers (Waste Watch 2010). There was a feeling (mainly among government agencies) that local authorities' were simply not allocating adequate funds for waste management because other services take priority.

The business aspect of waste management necessitates 'healthy' financial gains, particularly to sustain operations and to encourage investments. However, the

concern (mainly from environmental lobby groups) that private sector companies are more interested in the business end than finding the best solution for local communities is a recurring message. Nevertheless, the tendency to be swayed by public opinion on controversial issues (such as variable charging) is not isolated to politicians as is evident from comments by a waste collection authority on the use of financial incentives to stimulate behaviour change.

Some participants from the waste industry (and private sector organisations) tended not to acknowledge or reflect on potential conflicts between the financial goals of their employers/sector and how their own intellectual or moral positions might be influenced by such commercial motives. Local authorities and industry experts tended to see themselves as the 'neutral' party, capable of rationale debate and seemingly unaware that other aspirations and incentives, such as financial gain, pressure from LATS, political support and public acceptance, might influence their worldview and judgement.

The large majority of citizen groups (92%) show more preference for a greater number of recycling schemes that include source separated materials (e.g. at kerbside) and collection of food waste (71% of key stakeholders and 64% of local authorities agreed). Similarly, aspirations for high recycling/composting rates (≈ 70%) had more support from citizen groups and key stakeholders. From interviews, it is mainly environmental lobby groups that show support for higher recycling on the basis that it is resource efficient and generates business. Participants from industry and local authorities are more sceptical because kerbside sorting is resource intensive and there are inadequate local markets which act as a disincentive for recycling; a view also supported in the literature (RBKC 2006). Other motives include local authority objectives that implicitly prioritise landfill diversion targets over recycling, largely because of the financial penalties associated with landfill.

7.2.2: Acceptable technologies

There is a general awareness for the need to adopt technically sound, viable and socially acceptable technologies. In terms of residual waste management, the large majority of key stakeholders (82%) and local authorities (75%) showed preference for adopting a broad mix of waste treatment technologies, approved by government.

Most of the comments (during interviews) focused on the lack of clarity in the approach to waste management and the need for central government to 'set a national framework for every authority to follow', while leaving the choice as to what blend of technologies to use in a particular locality to the private sector operator. There was less support for this approach across the citizen group (56% agreed and 13% disagreed). From interviews, one environmental lobby suggest that since waste is becoming a lucrative business, the private sector operator 'should not be allowed to dictate the waste policy to local authorities'. This is consistent with the recurring message from the citizen group that private sector companies are more interested in business objectives than finding the best solution for communities.

There is great disparity ($p \leq 0.05$) in preferences for a more positive national policy towards energy recovery through EFW incineration(88% of local authorities, 71% of key stakeholders and 31% of citizens agreed; while 63% of citizen groups and 18% of key stakeholders disagreed). There was a general feeling (from interviews) that local authorities need to be more 'honest' and 'candid' with the public in terms of how they prioritise environmental issues, particularly with potentially contentious technologies such as EFW incineration.

One participant from the private sector felt that by building EFW plants within local communities, government is prioritizing national benefits (from avoided CO_2 emissions) over local benefits (avoiding local emissions which potentially could have negative implication for human health). Most notable was the lack of citizen support for a more positive policy on EFW incineration as a source of energy production, which is consistent with a poor opinion of the potential for the technology to be implemented at either, the local and national level. The opinion of some environmental groups appears to be associated with the tendency for local authorities to present EFW incineration as 'the only option', whereas a more balanced reflection on the choice of options is considered more acceptable.

The tension around EFW incineration has prompted a call for government to develop a national statement on the health effects of EFW incineration facilities (71% of key stakeholders, 67% of local authorities and 63% of citizen groups agreed). It is clear (from interviews) that most participants support this on the basis that it could clarify

the health impacts of such facilities and, as the literature suggests, address concerns around waste-related exposure which raise questions of environmental justice (Martuzzi and Forastiere 2010).

7.2.3: A more democratic and socially engaging decision process

Several suggestions were made (during interviews) about ways to achieve a more depoliticised, democratic and socially engaging decision process. A local authority suggested the planning situation could be improved if the relevant authorities 'dealt sensitively with the strategy and included some mechanism to reduce controversy related to siting facilities'. One suggestion was for politicians to take long term strategic decisions that last over the lifetime of several local authority administrations (the large majority of local authorities (92%) and key stakeholders (88%) agreed). From interviews, some local authorities felt policies against incineration are being imposed by political administrations. Although only half (50%) of citizen groups support long term strategic decisions – one participant suggested this may ensure solutions are sustainable (as opposed to politically acceptable). On the other hand, there was positive correlation between key stakeholders' preference for long term strategic decisions and political support, which is consistent with comments from participants in the waste industry that suggests the imminent pressures of landfill diversion targets are driving politicians to be less 'dogmatic' in the position taken on incineration.

The social injustice and disparities in health impacts of waste facilities, where residents feel that risks are imposed on them (Aldrich 2008; Wolsink 2007; Adger 2002; Elliott 1998; Petts1992) may explain the great support for establishing a more equitable process for siting waste facilities (82% of key stakeholders, 82% of citizen groups and 70% of local authorities); possibly confirming suggestions (during interviews) that this may encourage communities to be more accepting of these facilities, particularly at the local level. To confirm this, negative correlations were revealed between key stakeholders' preference for an equitable siting process and the importance of local environmental impacts and political support; suggesting that the greater the priority placed on local environmental issues and political support, the less potential there is for the siting process to be equitable. However, this is not to

say that political support or an equitable sharing of environmental risks would be, on its own, a sufficient condition to build trust in local authorities.

The literature points to need for the exact location of allocated sites and locational criteria (subject to community consultation) to be included in waste local plans (SITA 2010). This is supported by the majority of citizen groups (88%) who felt sites ought to be included in the waste strategy; possibly confirming opinions (during interviews) that this would encourage more citizens to take an interest in the waste strategy. Some key stakeholders (64%) and half (50%) of local authorities agreed, although conclusions drawn from interviews suggests 'there is a big exercise local authorities need to do in terms of public engagement and education so that people understand the need for treatment facilities'.

When prompted, local authorities tended to relay scepticism about the ability to engage the 'hard-line' environmental lobby groups, who are perceived as 'radical and uncompromising', in the position taken on EFW incineration. A member of a citizen panel was more critical about the ability of local authorities to effectively communicate the benefits of such technologies to the community 'many people don't like the concept of EFW incineration and part of that comes back to the fact that the education system is wrong. Local authorities fail to tell people it is not what they like but what is best for the community on the whole – this is where it fundamentally starts'.

Current policy driven by localism is set to devolve new powers to local authorities and establish new rights for local people and communities in waste management decision-making (DCLG 2011). However, devolving decision-making power from county to town level was seen by the majority of participants, particularly local authorities (42%) and key stakeholders (35%) as having the least potential to improve how waste strategies are delivered; though comments from interviews (mainly citizen groups) suggest this would reduce the level of political influence on decision-making.

7.3: Factors influencing the approach to public involvement

Generally participants felt public involvement is 'the right thing to do' but the main challenge in adopting a more deliberative and participative approach to decision-making is 'creating effective dialogue in a regulatory culture where participatory democracy is not practiced'. Conclusions drawn from interviews suggest local authorities need to be more open and present a balanced reflection of the choice of technology in order to engage the public, establish their trust and avoid opposition to waste facilities.

The aim of any deliberative and participatory approach should be to 'negotiate a workable, relatively fair solution that not everybody agrees with but the vast majority can accept'. This section discusses how approaches to public involvement are rationalised. The approaches identified are categorised in terms of how consultees are selected/engaged and the more general methods/techniques for involving the public earlier in decision-making.

7.3.1: Selection / engagement of consultees

The large majority of key stakeholders (95%), citizen groups (88%) and local authorities (85%) felt that setting up community liaison groups is desirable during facility planning; where positive correlations were revealed between key stakeholders' preference for establishing community liaison groups and the type of waste facility and local situation. There was a general feeling (among interview partipants) that these groups give the public an opportunity to get involved early in the planning phase – one local authority relayed how input from residents changed aspects of the architectual design of an EFW incineration facility and the routing of vehicles to the plant: 'the one thing we were keen not to do is consult people without being willing to change our plans'. Similarly, the literature points to the need for an agreement on how public input solicited during consultation will influence the policy (e.g. Bull *et al.* 2009; Petts 2008; Hyder Consulting 2007; Petts and Leach 2000).

The majority of key stakeholders (88%) felt technical experts and a representative group of the public ought to be consulted simultaneously (e.g. in seperate parallel sessions), early in the process. There was less support for this across the citzen group

(59%) and local authority group (46%). There was positive correlation between citizen group preference for consulting public and experts togther and public interest in waste management, possibly rejecting claims that this may affect the extent of public involvement.

Comments from citizen groups (during interviews) suggest the involvement of ordinary citizens in decision-making is perquisite to getting a good representation of communities and the range of people interested and willing to participate. Reinforcing this point, data trends reveal the majority of citizen groups (81%) felt the entire public should be given a fair and equal opportunity to be involved in all decision-making (60% of key stakeholders and 54% of local authorities agreed). On the other hand, there was positive correlation between local authorities preference for consulting experts and the public together and the cost of public engagement strategies; possibly reflecting the opinion of some local authorities that involving the general public at the very early stages could be costly.

Contrary to views (during interviews) that many local authorities fail to realise the resource implication of poor consultation, there is a feeling among few participants (47% of citizen groups, 35% of key stakholders and 28% of local authorities) that the decision on the type of facility, its location and the general benefit to society needs to be debated by experts and politicians, and while public opinion is considered, it is unlikely to influence the final decision.

Reflecting on data trends, there appears to be some consensus that the type of waste facility (88% of citizen groups, 80% of key stakeholders and 75% of local authorities) and the local situation (93% of citizen groups, 81% of key stakeholders and 79% of local authorities) largely influences the level to which the general public is involved in waste management. This is consistent with the literature where it is suggested engagement ought to respond to 'context', paying specific attention to the nature of the problem, composition of the community, history of controversy and potential institutional or political barriers to engagement (Bull *et al.* 2010; Benneworth 2009; Chilvers 2009; Chess and Purcell 1999).

There were several suggestions from participants on the 'right' approach and level of public involvement. For instance, consulting a small group of stakeholders early in the process and then the general public after the strategy is developed is most desirable for local authorities (58%) but undesirable for citizen groups (47%), where there was positive correlation with the cost of public engagement strategies; possibly related to the opinion of some local authorities that involving the public at the very early stages could be costly. This is confirmed in the literature where is suggested the process ought to be cost-effective to encourage sponsors to pursue more deliberative forms of engagement (e.g. Creighton 2005; Petts and Leach 2000). However, the data trends indicate over half of local authorities (55%) felt the added cost, time and resources required for early public involvement has least impact on the level of engagement, which perhaps reflects a position they feel 'ought' to be taken on the issue, rather than a 'real' opinion.

There is much wider demand for involving politicians and the media across key stakeholder and local authority groups (73 - 92%) than citizen groups (53 – 59%). Overall, there was greater preference for involving politicians in the consultation process, where there was negative correlation between key stakeholder preference for involving politicians and public stance on waste issues. Reflecting on interviews, there was a feeling that if the process is set up without engaging politicians, then potentially further down the line, they could undermine it or disregard the recommendations of experts. This is consistent with the general feeling that politicians are driven to adopt more popular solutions and hence, should be engaged in debate around what technologies offer the best solution to the waste management problem and benefits to communities. Experiences with analytical-deliberative processes suggest this is an important strategy for drawing out different interests and allowing for certain 'fixed positions' to be challenged (e.g. PPS 2008; Bull *et al.* 2008; Petts 2008 and 2001; Stern and Fineberg 1996).

7.3.2: Methods / techniques for 'early public involvement'

Reflecting on interview data, there was a feeling that early public involvement is most beneficial when the right processes are set up for effective communication - one participant suggests 'this strengthens groups and avoids stand offs or impasses'. The importance of educating the public before engaging them in debate was

universally recognised ($p = 1$) across groups (i.e. 100% of key stakeholders, 94% of citizen groups and 84% of local authorities). Although the literature (e.g. Pellizzoni 2003; Irwin 2001; Petts 1994) points to the tendency for the public to be more interested in the practical issues of waste management and the local impacts of facilities (e.g. health impacts, nuisances such as dust or noise), the data show there is some awareness of the need for citizens to engage at the strategic level. For instance, one member from a citizen panel recognised the need to consider wider sustainability issues to be able to comment on the waste policy even though 'it is probably more interesting to look at the practical issues of waste'. In other instances, local authorities felt there are difficulties engaging the 'hard-line' environmental lobby in negotiations because:

- they show interest only in contentious issues
- come along with their own 'fixed agenda'
- are just eco-warriors

There are significant differences in opinions ($p \leq 0.05$) regarding whether residents ought to be involved in setting recycling targets and identifying the different types of waste management options. Most citizen groups (86%), key stakeholders (75%) but fewer local authorities (54%) agreed. Reflecting on interviews, local authorities suggest citizens and stakeholders tend to set 'optimistic targets' based on personal aspirations which may have certain impacts and demotivating effects if they are not achieved. The literature points to policy (e.g. Packaging Waste Regulations 2005) that places a legal and binding responsibility for reducing waste with businesses (Defra 2006b) which acts as a disincentive for local authorities to actively work with communities to reduce waste.

Using a combination of different methods (e.g. surveys, focus groups) for consultation throughout the decision process is supported by key stakeholders (88%) and local authorities (80%), though less so by citizen groups (59%). Similarly, the use of different methods at each decision stage has some support from key stakeholders (69%), local authorities (56%); and half (50%) of citizen groups. There was correlation between local authorities' preference for the use of different methods and the stage of the decision process. Reflecting on interviews, a stakeholder

engagement facilitator suggested that most local authorities use traditional public consultation methods (e.g. opinion polls and public surveys) because 'they want the process to be transparent and accessible to the general public'. But the fundamental problem with traditional forms of consultation, as expressed by a participant from a citizen's panel, is that 'they are too short and too technical'. This is consistent with the managerial ideology that regards social and political issues as technical and/or procedural matters to be managed (Desai and Imrie 1998). However, there are also issues associated with implementing deliberative and participatory methods designed to allow the public to take a more integral role in policy discussions and decisions. For instance, some participants (mainly from local authorities) felt:

- they are not accessible to the general public
- most are high in cost and time consuming
- there are difficulties in finding the right technique to deliver technical understanding without being patronising to citizens

Experiences with analytical-deliberative methods suggests there is a need for independent and competent facilitation of discussions to optomise benefits associated with social interaction and opportunities for mutual learning and trust building (Petts 2008; Bull *et al.* 2008; Stern and Fineberg 1995). Similarly, there is wide acceptance of the need to employ independent and experienced facilitators (81% of key stakeholder, 78% of local authorities and 73% of citizen groups), where there was positive correlation with the local situation and public interest in waste management; and negative correlation with the type of waste facility. A member of a citizen panel suggests the facilitator should have the 'necessary communication skills and relevant knowledge of waste issues'. A stakeholder engagement practitioner felt the facilitator should to be impartial but have the ability to empower citizens.

7.4: Waste management priorities and preferred methods for early public involvement

The general conclusion drawn from interviews is that the waste strategy is deliverable if it is sustainable, cost-effective and socially acceptable. This generally requires 'local authorities to balance the priorities of experts and the community against costs, political and environmental issues'. It also requires an adequate

provision of funding to meet infrastructure and service delivery requirements. In this context, this section attempts to align different approaches/techniques for public involvement with factors (i.e. stakeholders' priorities) identified as important for assessing the deliverability of waste management options.

7.4.1: Selection / engagement of consultees

Setting up community liaison groups during the facility planning phase is popular among all groups (95% of stakeholders, 88% of citizen groups, and 85% of local authorities); presumably because it reduces impacts to the local community and potential opposition to facilities in the long term. The literature points to other benefits associated with reconciling different concerns and problem representation to build a common base of information, relationships and promote mutual understanding (Petts 2006; Creighton 2005; Wakeford 2002; Stern and Fineberg 1996). A convenor of a community liaison group relayed (during interviews) the success of gaining planning approval for three EFW facilities hinged on establishing a clear remit for the public and being willing to amend the facility proposal based on residents' feedback. It also hinged on maintaining a level of openness and transparency through early and continuous forms of communication.

Experiences with public engagement suggest the synthesis of knowledge about risks and uncertainty inherent in waste management decision making is achieved through analysis and deliberation (e.g. Petts 2008; PPS 2008; Petts 1995). There are mixed views regarding the approach to expert-citizen deliberations. For instance, the majority of key stakeholders (88%) felt technical experts and a representative group of the public ought to be consulted simultaneously (in separate parallel sessions), early in the process. In comparison, there was less support for this across the citizen group (59%) and local authority group (46%). There were positive correlations between citizen groups' preference for consulting the public and experts together and the importance of stakeholder priorities such as public acceptance and political support; possibly confirming opinions (from interviews) that engaging communities on the waste strategy reduces the level of opposition to waste facilities. However, there appears to be greater support for early involvement of the public at the facility planning stage - one local authority felt both technical judgement and negotiation with communities is necessary for reducing impacts because 'there is a lot of work to

do with the public in terms of trade-offs around optimal size of plant, travel distances etc.'.

It appears that any approach to public involvement potentially leads to conflicts around public expectation. One local authority suggests a general framework be established for public consultation; whereby local authorities would be able to adapt it to their local situation to 'allow some consistency in the [methods] adopted'. Amongst the different methods, consulting a small group of stakeholders early in the process and then the general public after the strategy is developed is most desirable for local authorities (58%) but undesirable for citizen groups (47%). The main reason for local authority support is that the approach appears to be more cost-effective than encouraging public involvement early in strategy development.

It was also suggested (mainly by local authorities) that the main priority for residents is an efficient and cost-effective service and that only residents that live near waste facilities prioritise health and environmental impacts. Thus, it is reasonable to assume that the approach is supported on the basis that it may proved difficult (in terms of public interest) and controversial to include the general public in strategic planning.

7.4.2: Methods / techniques for 'early public involvement'

There are significant differences in opinions ($p \leq 0.05$) regarding whether residents ought to be involved in setting targets for recycling and preferences for different types of waste management technologies and collection schemes. Most citizen groups (86%) and key stakeholders (75%) agreed; but only just over half (54%) of local authorities agreed. Most citizen groups (particularly environmental lobbies) felt it was important to recycle and reduce waste - some suggested that public education to encourage responsible behaviour should have greater priority for local authorities. On the other hand, some local authorities expressed concerns about the optimistic targets that stakeholders and citizens set for waste minimisation (and recycling).

The majority of participants felt it is important to educate the public before engaging them in debate about waste policy issues and technological risks (i.e. 100% of key stakholders, 94% of citizen groups and 84% of local authorities). There were positive

correlations between local authorities' preference for educating the public before engaging them in debate and the importance of stakeholder priorities such as funding, political support and public acceptance. This is confirmed by participants comments (during interviews) which suggest that although public involvement is a costly exercise the decision process benefits from early social input in that 'people are more likely to feel in control of waste management situations, instead of feeling the decision has been taken out of their hands'. The literature suggests this produces long term benefits and potentially voids conflict associated with public opposition to facilities (e.g. Petts 2003 and 1992; Snary 2002; Elliot 1998).

There is good support for soliciting ideas from the public on the type of activities and events to involve the public in decision-making (81% of key stakeholders, 71% of citizen groups and 63% of local authorities); perhaps suggesting citizens would be more forthcoming and willing to engage if the approach to consultation is appropriate. There is clearly potential to address controversial issues (e.g. traffic increase, noise, recycling rates) if citizens agree with the level and method of engagement in the first instance.

There is some support for authorities and citizens to jointly select experts mainly across the key stakeholder (44%) and citizen (41%) groups. There is less support from local authorities (16% agreed and 38% disagreed) where there was positive correlation with recycling targets. Reflecting on interviews, there was a feeling (mainly among local authorities) that there are difficulties in engaging groups who take a 'fixed' position on waste issues (e.g. environmental lobby or community action group) – one suggested citizens' aspiration for high recycling rates (≥70%) could lead to the adoption of 'unrealistic' waste management targets, which may have de-motivating effects if they are not achieved.

The use of different methods at each decision stage has some support from key stakeholders (69%), local authorities (56%) and citizen groups (50%); however, few participants from the citizen group (38%) disagreed. Similarly, using a combination of methods (e.g. surveys, focus groups) for consultation on the strategy and facility proposal is widely supported by key stakeholders (88%) and local authorities (80%), though there is less support across the citizen group (59% agreed and 38%

disagreed). There was positive correlation between local authorities' preference for using a combination of different methods and cost-effectiveness, and negative correlation between citizen groups' preference for using a combination of different methods and public satisfactions; perhaps confirming perceptions that this may involve varying level of public involvement, largely controlled by authorities..

7.5: Conclusion

There are major challenges associated with selecting appropriate technologies to manage municipal waste and securing the necessary planning approval, particularly when community views, political aspirations, policy and financial imperatives collide. There is a level of uncertainty among participants regarding what processes provide deliverable waste strategies and the extent to which public involvement may resolve conflicts around technological and social risks. This uncertainty illustrates that in the face of scientific, moral and health-related uncertainty, deliberation requires exploring different perspectives and value claims, and conflicting relationships in order to address distorting influences of political and emotive-aesthetic values, ideological forces and financial and institutional imperatives.

The collection of opinions from the range of participants has produced new insights which potentially serve as input into broader debate around waste management issues and the potential for early public involvement. What has been demonstrated on a relatively small scale, acknowledging complexity, tentative suspension of judgement and collective exploration of arguments and opinions, may prove to be key features in the design of a more deliberative and participative process for waste management decision-making, planning and problem solving.

The next chapter discusses the opportunities for, and barriers to a more participative and adaptive decision process.

Chapter 8: Opportunities and Barriers to Analytical-Deliberative Processes: Integrating Stakeholder Views

This chapter considers the range of views of stakeholders from the waste sector with the aim of clarifying the opportunities and barriers to the use of analytical-deliberative processes in a UK waste management context. The intention is to draw on evidence of practitioners using analytical-deliberative structures for environmental decisions in the UK and abroad and, through a process of deliberation, draw out the key learning principles for adopting the approach. The potential for analytical-deliberation is discussed with a focus on possible interpretations and implications of the findings, in particular the perceptions and judgements of stakeholders, the complexity of issues regarding waste management, and the theoretical and practical demands for a more deliberative and participatory decision process.

The discussion is framed along the following components of analytical-deliberation:

- Problem framing (perceptions, interests and judgement of stakeholders)
- Process design (decision context including institutional issues, politics and culture, and the means of engagement, the necessary resources and capacity including funding, expertise and time)
- Option definition through data synthesis (stakeholder inclusion and representation; information provision, expert-citizen deliberation and option evaluation)
- Closure (decision impact and take-up)

8.1: Problem framing

Problem framing is usually contentious in decision-making because the way risks are framed partially determines how they are analysed and understood, thus affecting the decision taken (Vaughan and Seifert 1992). In waste management, the way the problem is defined will affect the policy options considered and their potential to respond to national (and global) objectives as well as local environmental, economic and social priorities (Petts 2000).

8.1.1: Perceptions and interests

A common issue with traditional consultation processes for municipal waste management is the institutional and regulatory framing of the waste problem, which usually emphasises the application of technical knowledge, expertise and techniques of problem solving. The tendency to frame waste issues in this way is often at odds with public interest, local groups and residents' perceptions of risk - for example, citizens' strong apprehension towards incineration as a policy option (Petts 2004; McAvoy 1999). Such issues necessitate a decision in advance on whether extensive deliberation integrated with analysis is necessary, which is often difficult to determine (Stern and Fineberg 1996).

To some extent, it depends on the nature of the problem. It is highly likely that a risk decision will require extensive deliberation, integrated with analysis if the issues are social in nature and more broadly defined, or if there is much disagreement about potential impacts of the technology (or policy) under consideration (Chapter 3). In these situations there is a need for clear distinctions to be made between stakeholders who have 'interests' (often direct, financial or regulatory) and people's values and principles (often expressed through their beliefs, attitudes and 'worldviews') (Petts 2004). Less intensive (and perhaps less inclusive) forms of engagement may be pursued if the interests are narrowly defined and there are common views regarding the impacts from the technology/policy (Chapter 3).

Participants' discussion around a number of concerns associated with implementing waste management technologies revealed other framing issues (Chapter 7). Most notable is the propensity of local authorities to frame the waste problem around technological, environmental and economic issues, dealing only with a small part of the underlying social concerns such as perceptions around health impacts (Petts 2004; 2000; 1994; Snary 2002). The continual reshaping of waste policy by European legislation and policy innovation has introduced uncertainty about goals and priorities for waste managers (Bulkeley *et al.* 2005). There are concerns related to local authorities' pragmatic pursuit of government targets and goals related to efficiency savings, which does not necessarily promote sustainable practice (Slater *et al.* 2007; COSU 2002). The research findings suggest an added concern is the

business objectives of private sector operators that potentially override goals associated with finding the best solution in the interest of communities (Chapter 7).

The diverse and competing interests, values and principles regarding the goals and priorities for waste management largely influence how solutions are rationalised. The findings show significant disparity in stakeholders' preferences for technologies at the local level, where citizen groups tend to prefer composting and anaerobic digestion on the basis it avoids impacts associated with siting EFW facilities. Although local authorities prefer composting and EFW incineration at the local level, there are concerns regarding residents' perception of social injustice and disparities in health impacts from waste facilities (Chapter 7). These differences suggest engaging a wider group of stakeholders and citizens early in decision-making, particularly at the strategic level raises awareness of the level of ambiguity implicit in the way the waste management problem is framed, which, although making it difficult to reflect specific interest positions, ensures dissent and differences are engaged and understood (Petts and Leach 2000; Stern and Fineberg 1996).

The level of uncertainty regarding the goals and priorities for waste management exposes a sort of tension between the so-called 'inflexible stance taken on EFW incineration' by a public stereotyped as 'irrational and fearful' and 'unrealistic in their aspirations for recycling', and the view that landfill diversion (often through EFW incineration) is prioritised on the basis of government targets and not because it is 'inefficient and impractical' to pursue higher level of recycling (Chapter 7). These views reflect the level of ambiguity around the concerns and values of different interest groups, raise awareness of the framing effects and potentially determine the limits of what may be deemed reasonable within the plurality of interpretations of the risk problem (Pimbert and Wakeford 2001; Renn 1999).

8.1.2: Stakeholder judgement

The findings around stakeholder priorities and preference for waste management technologies suggest local authorities and industry experts tend to see themselves as the 'neutral' party, capable of rationale debate and seemingly unaware that other aspirations and incentives such as financial gain, pressure from LATS, political support and public acceptance might influence their worldview and judgement.

Some local authorities felt that the dispute and controversy over waste management technologies necessitates an objective decision based on rational debate, where 'facts are put into the mix, rather than emotion'. However, such blind belief in technical rationality and the impartiality of expert opinion is vulnerable to being pulled apart so that the underlying assumptions are exposed to public review and reflection (Jasanoff 1987; Kasper 1980). From the findings, this is most notably the case where citizen groups (mainly environmental lobby groups) question the ability of technical assessment to adequately deal with public concerns about the impartiality of technical experts and decision makers – for example, whether the business objectives of private sector operators are overriding goals associated with finding the best technologies for communities (Chapter 7).

There is evidence in the literature that also suggests technical assessments are inadequate in dealing with public concerns about the effectiveness of regulatory control and the robustness of scientific understanding of risks – where, for instance, public dissatisfaction with the traditional 'closed' policy process often results in local people feeling that council decisions and the views of elected representatives do not reflect their own priorities and those of the community (Petts 2004; Burgess *et al.* 2001; Imrie and Racot 1999). This is evident from the findings where there are distinct differences among stakeholder priorities for waste management (Chapter 7), emphasising the need to represent disparate views during problem framing.

The difficulty inherent in using technical assessment to evaluate social and political problems has been associated with the legitimacy of decisions, where questions concerning the validity of scientific knowledge in social reality exists (Sarewitz 2000; Rutgers and Mentzel 1999; Weingart 1999; Renn *et al.* 1995; Saward 1993; Fiorino 1990). Habermas's model has much support in the literature (e.g. Frewer and Salter 2002; Kates *et al.* 2000; Renn 1998) and suggests that the development of policies, strategies and plans should be directed by an interpretative value system, where the interests reflected in these value systems would be controlled by examining them in light of technical possibilities and the strategic means of their satisfaction. This, however, does not imply that lay knowledge is better than that of experts but rather reflects the need for a multiplicity of views to restrict, for example, the tendency to narrow down alternatives (Wynne 1994). Although this interpretative

value system is in line with the renewed political process based on localism (Chapter 3) and suggests an alternative to the 'aggregate' or 'vote centric' models of democracy (Morphet 2008); the problem is the extent to which the waste management processes can be sufficiently opened-up to admit a wider range of understandings than merely that of technical experts into the initial problem framing (Horlick-Jones 1998).

The public framing role is also constrained in recent practice due to the construction of a strict separation between (citizen) deliberations and (expert / scientific) analyses (Chilvers 2007; Petts 2003). The case examples of analytical-deliberation reviewed (Chapter 3) demonstrate the impact of a constraining regulatory regime that introduces boundaries for citizen and stakeholder input in the development of (innovative) solutions. The findings revealed a rather pessimistic view (orchestrated mainly by local authorities) of the possibilities for active forms of citizen involvement in problem framing. Additionally, data trends show most local authorities have similar views regarding public involvement beyond the framing stage (i.e. during the development of evaluation criteria and the assessment of options) (Chapter 6). The tendency of local authorities to privilege technical expertise over public knowledge, insulating the problem framing stage (and others such as criteria development) from citizen interaction, indicates that past institutional assumptions about public ignorance and incompetence may still hold (Chapter 3).

The propensity to compartmentalise the role of citizens and experts based on pre-judged epistemic / ethical competencies rather than seeing these as emergent qualities (Healy 2004; Pellizzoni 2003; Young 2000; Lafferty 1999; Perhac 1998; Lafferty and Eckerberg 1997) is evident in views of stakeholders, where, for example, local authorities perceive expert knowledge to be more relevant than local knowledge during strategic planning (Chapter 6). Such opinions potentially undermine the benefits of interaction that can enhance mutual learning between experts and citizens (Webler *et al.* 1995; Irwin 1995), the integration of social values into technical decisions (Petts 2008; Bull *et al.* 2008; Renn 1999; RCEP 1998; Dryzek 1990) and public trust and confidence in decision-making and decision makers (European Commission 2004; ILGRA 1998; Petts 1994; Armour 1991). However, the tendency to rely on 'rational debate' is not isolated to local authorities

and industry experts as citizens have also tended to rely on scientific and quasi-scientific arguments to justify their views (Petts 2004). The data illustrate it is often the case in arguments presented by opponents to waste facilities, where one of the most effective ways of appealing against a facility proposal is raising the issue of increased transport that potentially has a negative impact on local air quality and human health (Chapter 6).

Furthermore, the debate among participants in the study suggests the public tends to be more interested in the practical issues of waste management (e.g. location of sites) and the local impacts of waste facilities (e.g. health risks, traffic increase, nuisances such as dust or noise). The wide support from citizen groups to include sites in the waste strategy potentially confirms this point (Chapter 6). Petts (2000) suggests citizens tend to be complacent about strategic decision-making, so it often difficult to engage local communities at this level. However, there is a growing awareness of the need for citizens to engage in debate around strategic issues, largely because many of the policy and plan issues are fixed at the facility siting stage, which limits the ability of the public to influence decisions (e.g. Snary 2001). Contrary to such views, one of the main outputs from this research is the realisation that local authorities are more receptive to engaging communities on facility plans, where public input may lead to changes in the characteristics of facilities (e.g. design, size, routing of vehicles) and the identification of design alternatives that are more acceptable to the public (Chapter 7).

Nevertheless, the framing of waste management issues in a more socio-technical context necessitates the contribution from a wider group of stakeholders, specifically in consideration of the nature of the risks and the level of assessment required. The iterative nature of analytical-deliberative process requires problem framing to be open to public input so that a wider range of issues are considered in identifying solutions and ensuring the relevant risks and impacts are considered during option appraisal. The findings reveal a need for greater awareness of the benefits of public representation and 'moral or cultural forms of rationality' (Chapter 3) in constructing and framing waste management issues. However, the importance of expert-citizen deliberations is more widely recognised across the citizen group, where there is much greater conviction about the possibilities for active forms of citizen

involvement during problem framing (Chapter 6). As some participants noted, local authorities are becoming more aware of these benefits largely due to sporadic experiences with deliberative and participatory activities that are seen as a means to satisfy citizens' democratic right to participate and to gain their support for waste management facilities. UK experiences of analytical-deliberative processes during waste strategy development suggests public involvement can be more successful (i.e. open, transparent and fair) if local knowledge and experience is fed directly into the policy process, contributing to problem framing, development and evaluation of options.

8.2: Process design

A significant challenge for waste management decision-making is designing an approach that is effective, efficient and appropriate in dealing with technological risks, environmental impacts and economic issues, as well as the social and institutional conditions surrounding waste management decisions. The literature points to the need for deliberative events with an explicit connection to the decision process so there is 'real' impact on policy or solutions (Dorfman *et al.* 2010, Benneworth 2009).The research suggests this can be achieved through a more depoliticised, democratic and socially engaging decision process, where the majority of participants showed support for a more equitable process for siting waste facilities (Chapter 7).

8.2.1: Decision context

Criticisms around the structure and administrative handling of decision-making processes that attribute and distribute risk among communities mean that the trust in local authorities is always at stake. The risk research literature has revealed evidence for this in the siting of waste facilities (Snary 2002; Petts 2001; 1997), and the data suggests that instances of public opposition to controversial technologies such as EFW incineration emerge from factors related to perceptions of inequality and unfairness (e.g. Chapter 5).

Issues regarding trust raise questions of how to achieve a decision process that will be perceived as legitimate, reasonable, responsive and fair (Pratchett 1999; Crosby

1995). Wolsink (2007) suggests that 'distributional fairness' and 'fairness of process' are fundamental issues in the public's perception of risks. Similarly, issues of legitimacy (largely related to fairness of process) is associated with meeting legal conditions for participation as well as adopting justifiable and consensual approaches to decision-making (Parkinson 2003; Jones and O'Toole 2001; Estlund 1997). Designing a process to achieve perceptions of fairness and legitimacy requires an equal distribution of opportunities to act meaningfully in all aspects of the participation process (i.e. setting the agenda, establishing procedural rules, selecting information and expertise to inform the process, and assessing validity claims).

This calls for a 'professional' approach based on agreed terms of reference that all participants (particularly the public) perceive as fair and legitimate. This requires: 1) identifying whether public input is being sought to frame strategic issues or address concerns during facility planning and construction, 2) identifying the relevant stakeholders and communities to participate, 3) providing a forum where the public can voice their concerns and opinions without fear of conformism and compromise, and 4) developing a clear remit for active public involvement during analysis and deliberation on policy options in terms of both strategic and local implications (Petts 2008, 2006; Defra 2005g; Stern and Fineberg, 1996).

However, one of the main challenges identified from this research is the difficulty in 'creating effective dialogue within a regulatory culture that does not support participative decision structures' (Chapter 7). This highlights the importance of 'context' (e.g. Bull *et al.* 2010; Benneworth 2009; Chilvers 2009), emphasising the need to respond to institutional and cultural barriers to greater public involvement. While government guidance is promoting a more fundamental, constructive engagement with communities and stakeholders (Chapter 2); these are based on aspirations of localism with no legislative support to stimulate such change. The lack of regulatory support has meant that early public involvement initiatives suffer from a lack of funding (Petts 2004) and sufficient expertise which has restricted the level of innovation and experimentation with public involvement initiatives at both strategic and local planning levels. However, despite such limitations, there is evidence of successful consultation and engagement in the waste sector (Chapter 3),

reflecting the ability of practitioners to work with the regulatory regime, rather than being constrained by it.

Some researchers (e.g. Petts 2004; Renn *et al.* 1995) suggest deliberative and participatory processes may also be seen as a threat to the identities of experts, elected officials and policy makers who favour the 'tyranny' (Cooke and Kothari 2001) or 'technocracy' (Chilvers 2007) of participation. From the findings, this is evident in the tendency of local authorities to favour public involvement in consultation after the strategy is developed (Chapter 7). Evidence from the research shows that there is a technocratic policy culture that views deliberative and participatory processes as a potential cause of conflict and delays, where there is some concern that public input into decisions may polarise opinions and create an excuse for inaction. In addition, some participants were doubtful of the ability to involve citizens and 'non-experts' in complex decisions as this potentially creates misunderstandings and misrepresentation of issues (Chapter 6). The literature points to other problems related to public apathy, disincentives to collective action and the added time and impracticality of deliberative and participatory methods, where there is a large increase in the number and variety of participants (Woljer 2000; Pennington and Rydin 1999; Carter and Darlow 1997).

The technocratic policy culture apparent in existing institutional structures for waste management often imposes narrow institutional framings that reflect strategic interest-based manipulation of issues, thus closing down opportunities for wider debates (Pellizzoni 2003; Irwin 2001). As a result, it is commonly asserted that local people consider 'consultation' as a means of *post hoc* rationalisation of pre-determined decisions (Burgess *et al.* 2001). The data indicate this perception was greatest across citizen groups (Chapter 6), where attempts to widen debate around strategic issues are sometimes treated with suspicion and cynicism in relation to the ability for citizens to have 'real' influence on decision-making (Chapter 5). Though this is not presumed to be a dominant culture, it does imply a need to reconstruct ideas around the deficit model of public understanding so there is greater awareness of the benefits of constructive dialogue among citizens, local authorities, experts and other stakeholders.

Thus the successful involvement of ordinary citizens beyond consultation (i.e. during problem framing, option definition, analysis and data synthesis) will require a cultural change for local authorities to consider public understanding of complex waste management issues as capable and legitimate, instead of assuming a deficit model of public ignorance (Bäckstrand 2003; Petts 1994; Wynne 1993). This presents a challenge as experts are generally unwilling to accept that in most environmental problems, scientific knowledge is not sufficient on its own (but should be subject to public scrutiny) (Fischer 1999). The latter is a particular issue as the scientific assessment of risk, underlying the information tends to be inadequate at the early stages.

8.2.2: Means of engagement

The findings suggest there is some optimism regarding the opportunities for public involvement as it is seen as 'the right thing to do' in most instances (Chapter 7). The reasons are associated with the idea of democratic renewal that follows closely from an understanding of a political process concerned with changing the attitudes and behaviour of citizens to fit a mix of institutions and practices necessary to modernise local government. In theory, the suggestion is that this new democratic polity improves the effectiveness of existing practices and also draws upon different components of direct, consultative, deliberative and representative democracy to create a new democratic order (Pratchett 2000). This is also supported in practice; UK experiences with analytical-deliberative processes (Chapter 3) demonstrate the success of running formal consultation activities alongside more innovative processes such as citizen advisory panels and stakeholder workshops.

The 'new democratic order based on a localist ideology of governance' (Chapter 2) calls for a more iterative communication process between public and experts to define important questions relevant to evidence and convincing forms of argument. Potentially this involves: definition of problems, their translation into policy issues, their re-definition in light of new knowledge, and the translation of knowledge into decisions (Kates *et al.* 2000; Habermas 1984). From the findings, expectations of such processes are not necessarily associated with consensual decision-making but more with the opportunity to negotiate a workable, relatively fair solution that the vast majority of interested and affected parties can accept (Chapter 7).

Experience with analytical-deliberative processes (Chapter 3) shows that, in practice, it is difficult to integrate deliberative and participatory structures with technical decision systems to extend participation beyond statutory consultation without the necessary regulatory and funding support (Petts 2004). This is evident from the findings where local authorities support engaging stakeholders early in the process and the general public after the waste strategy is developed, largely on the basis that it is more cost-effective (Chapter 7). The research suggests this approach is not acceptable to citizen groups, where there is a call for local authorities to be more open and present a balance reflection of the choice of technology early enough to effectively engage the public, establish their trust and avoid opposition to waste facilities (Chapter 5). Potentially, this will require a more inclusive and transparent process that promotes effective expert-citizen deliberation through the combination of expert and public knowledge to gain a richer understanding of the risk situation and a more holistic assessment of options and potential outcomes.

The literature suggests consultation methods that restrict or limit opportunities for public input are no longer considered suitable to a more educated, sophisticated and less deferential public (Albeson *et al.* 2003; O'Hara 1998; Inglehart *et al.* 1996). The research suggests this is most evident in the wide support for the use of community liaison groups that encompasses early and continuous forms of communication with the public during facility planning though construction (Chapter 7). Some local authorities suggest these have been instrumental in gaining planning approval for EFW incineration facilities where success hinges on establishing a clear remit for the public and being willing to amend the facility proposal based on feedback from residents.

The variety of meetings and information provision formats used in this approach (Chapter 3) is particularly suited to waste management decision-making, as it has the potential to reconcile the many different and valid perceptions (and representations) of the problem which encourages participants to find common ground (Petts 2006). Nevertheless, there are concerns inherent in adopting more deliberative and participatory methods and this includes raising unrealistic expectations of what can be achieved within communities, leading to even greater disillusionment with democracy – politics in particular according to Pratchett (2000). Experiences with

analytical-deliberative approaches suggest there are further concerns regarding the level of public representation or inclusion achieved in these processes (Chapter 3).

Perhaps a significant point, apparent in the literature, is the need to adopt a mix of deliberative and traditional forms of engagement in analytical-deliberative processes. Feedback from deliberative events is commonly fed into more formal or traditional consultation events (e.g. online surveys and public meetings), enabling practitioners to assess how wide based the views and concerns expressed in small group discussions are felt in the wider community (Chapter 3). This effectively enhances democracy in decision-making by capturing a wider range of interests on the issues, allowing participants to witness (and challenge the motives of) the positions taken either for or against the policy or technology, early in the process.

The findings show that the strategic combination of methods (e.g. surveys and focus groups) for consultation on the strategy and facility proposals, as well as the use of different methods at specific stages in decision-making, have more support from key stakeholders and local authorities compared to citizen groups, probably because this is perceived to involve varying levels of public involvement largely controlled by authorities (Chapter 7). As some local authorities suggest, a consideration has to be the cost-effectiveness of public involvement which generally necessitates the inclusion of 'representative stakeholders' as opposed to the general public at the early stages of consultation on the local waste strategy (Chapter 5). Other problems include citizens' tendency to set 'optimistic waste management targets such as high recycling rates', which may have de-motivating effects if they are not achieved; and similarly the 'radical and uncompromising position' taken on some waste management technologies, largely EFW incineration that potentially polarise opinions and delay decision-making (Chapter 5). These concerns raise the question of the extent to which methods can be integrated to allow participants, in both traditional and non-traditional events, equal opportunity to impact on decision-making. The main issue appears to be whether this can occur early on in the decision process (specifically at the strategic level).

The tendency for local authorities to exclude the general public from the early stages of decision-making (and from directly interacting with technical experts) highlights

the importance of research that aims to reconstruct ideas around a deficit model of public understanding based on non-participatory techniques (Irwin 1995; Wiedemann and Fermers 1993; Arnstein 1969) to a more democratic model of citizen empowerment based on analytical-deliberation (Alario 1998; Stern and Fineberg 1996). The necessary change in institutional structure for waste management entails adopting more deliberative and participatory methods (in association with traditional methods) that ensures citizens' values, local knowledge and understanding of issues, are considered alongside technical and scientific considerations.

While combining deliberative methods with traditional forms of engagement can be a vital part of a public involvement programme, the balance and level of integration achieved (early in the process) will depend on how inclusive the process is. Decisions regarding the level of inclusion will typically depend on the urgency of decision-making, the nature of the technology/policy, prevailing culture, values and history of the area, and the time, expertise and other resources available for public engagement.

8.3: Option definition through data synthesis

In analytical-deliberation, it is important that all relevant parties be represented and that the interests around the problem be comprehensive and include economic, political, social, and cultural and religious values. One of the problems of broad-based representation is how to integrate information from different sources or perspectives on the basis of the knowledge and values they represent (Rauschmayer and Wittmer 2004).

8.3.1: Inclusion and representation

The analytical-deliberative process itself necessitates some clarification of objectives regarding who should participate, the relevant interests and values participants bring to the table, and what roles they play in the process (Stern and Fineberg 1996). This is particularly relevant considering the lack of trust that stakeholders and communities have in the commitment and ability of local authority officers and industry experts to represent their interests. The findings suggest one possible

approach is to have full representation of all parties where issues are controversial or where there is obvious mistrust of key parties (e.g. waste management operators); a view that is supported by the literature (e.g. Benneworth 2009; Petts 2008; Bull *et al.* 2008). However, the problem inherent in identifying the different interests and values in waste management particularly at the strategic level necessitates the inclusion of a wide cross section of the community (Chapter 7).

A key question is how to determine whether the views gathered can be considered representative of those in the wider community (who are not direct participants). The findings suggest one of the main challenges for local authorities is deciding whether the 'hard-line' environmental lobby group represents public interest or a minority agenda based on the position taken on a particular issue (Chapters 5 and 7). Experiences with analytical-deliberative processes emphasise the need to ensure that people participating are in fact representative of the public - i.e. includes a full range of opinion and interests including un-empowered groups (e.g. those from low income households) and those with views that diverge significantly from those of the decision-making body (Chapter 3).

From the findings, it is clear that the decision on who is selected to represent the interests of local residents and the general public was a particular issue for citizen groups (Chapter 7), where the majority felt the entire public ought to be given a fair and equal opportunity to contribute to debate around both strategic and operational issues. Some practitioners suggest an effective approach to recruiting representatives of different interests groups for more deliberative events is to consider the concerns (or interests) of a stakeholder group rather than the 'position' the group takes on a particular problem (Chapter 3). This allows decision makers to focus on local and regional concerns that affect a wide cross section of the community instead of individual fractions of the community. However, the selection of relevant interest groups ought to be done in consultation with affected parties and relevant authorities so the public does not perceive this as an attempt by the local authority (or sponsoring agency) to establish a group that supports its own interest position (Chapter 3). Some important questions to consider in selecting a representative sample of the public are (Stern and Fineberg 1996; Petts 1994):

(1) how much representation should each interested or affected party have in the process
(2) who should be involved in the decision of who participates, and
(3) when an affected party has no obvious representative, how should its interests be represented.

The findings suggest the level of public involvement is likely to change depending on the type of facility and the local situation (see Chapter 6 and 7). Consequently, selecting a representative sample for public involvement necessitates some consideration of who is interested and affected by the plan, project or location of the facility as well as the social context in which public involvement initiatives may take place. The findings show the latter is largely concerned with the type of facility (i.e. whether is it likely to be contentious) and the local situation (e.g. culture, values and history of the area). If a decision taken to limit participation does not give adequate consideration to the social, political, institutional and cultural context in which public involvement takes place, then it may later prove detrimental to creating a legitimate and acceptable process (Bull *et al.* 2010; Benneworth 2009; Chilvers 2009; Stern and Fineberg 1996; Kasperson 1986).

While public representation dominates dicussion regarding the effectiveness of engagement, there are also concerns regarding whether expertise is broad-based enough to cover the range of interests pertinent to the problem situation. In practice the engagement of diverse expertise and stakeholder views (including that of local politicians) is advocated in potentially controversial situations (or where there is obvious mistrust of key parties) to draw out different interests, allowing for certain 'fixed positions' to be challenged (Chapter 3). The findings revealed some preference for engaging a representative group of the public and technical experts simultaneously (e.g. in separate parallel session) (Chapter 7); although for this to be considered acceptable to citizen groups it was suggested that a good representation of local interests necessitates the inclusion of ordinary residents from the community (Chapter 7).

From the findings, there is much wider support from local authorities and key stakeholders for involving politicians early in decision-making as it is seen as a way

of preventing councillors from undermining or disregarding the recommendations further down the line (Chapter 7). Involving the media early in decision-making had comparatively less support though it was suggested this would improve the accountability of the process (Chapter 7). The literature suggests that ongoing proactive liaison with the media enhances the quality and appropriateness of information delivered to the public, thus building rather than destroying public trust (Petts 2006; Crosby and Nethercut 2005; Slovic 1993).

8.3.2: Information provision, expert-citizen deliberations and option evaluation

One of the core values of effective public involvement is the provision of information that encourages more meaningful participation (IAP2 in Creighton 2005) and to provide valuable details and insights to use in the design of more appropriate and acceptable policies or solutions (BERR 2008; Perhac 1998; Fiorino 1990). As such, this has shifted the focus from information dissemination to a new mode of dialogue that establishes two-way communication between experts, policy makers and citizens (Miller 2001; RCEP 1998; ILGRA 1998). However, translating technical information into a form that is accessible to all parties or taking a selective approach in consulting experts (from the wide range of expertise) may lead to inappropriate provision of scientific information and undermine public trust. This is evident from experiences with community advisory committees (CACs) where complex issues can be made more complicated by information deficiencies and inadequate provision of expertise (Chapter 3). The experience of participants in the research suggests it is also difficult to find the right technique to deliver technical understanding without appearing patronising to citizens (Chapter 5).

The research findings suggest one problem with deliberative and participatory methods adopted for strategic planning is that they sometimes fail to achieve clarity in the provision of information, given that expert-citizen deliberations are often non-interactive (via printed information or formal lectures) (e.g. Chapter 5 and 7). Consequently they tend to lack the necessary levels of social interaction and opportunities for mutual learning and trust building essential in designing an effective analytical-deliberative process. In the waste management sector the availability of resources and time restrictions for public involvement can impact on

the level of interaction and opportunities for discussions in analytical-deliberative processes. Nevertheless it could perhaps be argued, based on experiences with the approach (Chapter 3), that citizens with a greater remit in the engagement process would require higher levels of training, time and support to facilitate organisational learning and cultural change in constructing public understanding of complex waste management issues (see also Irwin 1995).

One recommendation that emerged from the findings is the need for local authorities to provide communities with the necessary resources (including incentives) to facilitate the involvement of ordinary citizens, thus allowing them to make valid contributions to decision-making (Chapter 7). This adds to the literature which suggests the effectiveness of expert-citizen deliberations largely depends on the opportunities given to challenge 'experts' and the ability of citizens to access the information and knowledge necessary to do so critically (Petts and Leach 2000).

In practice there is a tendency (during consultation on the waste strategy) to separate technical analysis from citizen deliberation which potentially undermines the opportunity for informed debate and the possibility to reconstruct ideas around a deficit model of public understanding (Chapter 3). Often this leads to an analytical approach that treats each issue in isolation, implicitly separating the technical and economic from the social, cultural and political. The principle implicit in this approach is an assumption that the strategic process is linear and can be separated in terms of its design and implementation. As a consequence, the focus tends to be on the technical, informational and economic challenges to be addressed, with little regard for the political, social and cultural relations which shape waste policy and practice (Bulkeley *et al.* 2005).

From the data it is evident that the failure to integrate deliberative and analytical elements is largely unrecognised by local authorities and often it is assumed that an independent assessment of social impacts (usually carried out by technical experts ahead of a public consultation event) is a sufficient form of analytical-deliberation (Chapter 5). A more integrated form of analysis and deliberation where stakeholders and communities are allowed to take an active role in structuring the debate, determining the criteria and participating in option appraisal was championed on the

basis that decision-making should be made transparent so that 'ready-made solutions' are not presented to the public (Chapter 5). This collaborative approach adopted by some UK practitioners (Chapter 3) suggests it facilitates social interaction, which may improve public trust and increase the credibility of local authorities and their representatives (see also Petts 2008, 2004; Yearly 2000; Armour 1991; Funtowitz and Ravetz 1991).

The findings suggest the main challenge for local authorities is finding a fair and equitable approach for integrating information from public involvement events with outputs from a technical analysis of waste management options. This is particularly relevant where there are disparate views on the impacts of technologies such as EFW incineration. Evidence of analytical-deliberative practice (Chapter 3) suggests this may be addressed by bringing citizens' concerns into expert discourse through the development of exclusionary criteria (Chapter 3) that covers a range of technological and social factors, which allows for the consideration of diverse, sometimes competing interests, values and principles. This requires ongoing interaction and constant exchange of information between experts and stakeholders in a highly interactive learning process, where citizens are allowed (and encouraged) to question the information and data presented by experts. An important issue raised in practice (Chapter 3) and through the research (Chapter 7) is the need for independent and competent facilitation of discussions to effectively convert and convey information between scientific and lay participants to optimise learning. The challenge is how to create exclusionary criteria that the vast majority of stakeholders consider a fair and equitable representation of all interests and values that exist in the problem situation.

8.4: Closure

In an analytical-deliberative process it is very important to achieve sufficient closure i.e. where stakeholders agree on the recommendations, or at least a position upon which a decision can be subsequently taken. The minimum agreement may be a consensus about dissent. In this regard care is taken not to arrive at premature closure; so much of the focus (during process design) should be on establishing procedures for a timely, reflective and reasonably open-ended discussion (Renn 1999; Stern and Fineberg 1996).

Analytical-deliberative processes require political or public status to satisfy citizens' democratic right to participate and contribute at all levels of decision-making. The risk perception literature (Chapter 3) suggests the tendency of policy makers to privilege experts' analysis of risks over the perceptions of the public has been notable in the marginalisation of the public's role in identifying risks, particularly in siting waste facilities. From the data, it was suggested that consultation processes enter the political and public arena only after decisions have been made (e.g. Chapter 5). This is sometimes the case with consultation on facility proposals, where certain conditions in the waste local plan, for example the site location, are pre-determined and not up for discussion during consultation – i.e. at the pre-application stage (Chapter 5).

Experience with deliberative and participatory methods suggests the sponsoring agency (e.g. local authority) is not bound to adopt citizens' recommendations, which raises questions regarding the legitimacy of the process. One way of addressing this problem is to be open about how public views influence decision-making (Chapter 3). The experiences of some participants with deliberative and participatory events (Chapter 5) suggests good practice includes making 'explicit' rather than 'implicit' reference to how recommendations coming out of these events (particularly citizen comments) have changed elements of the plan, proposal or policy. This should also include what recommendations/suggestions could not be adopted or addressed and the reasons why (Chapter 3). It is expected that this approach would meet public expectations for more openness and transparency (particularly where technologies are controversial) and increase opportunities to establish trust between local authorities, experts and citizens.

The findings around the motivation and purpose of public involvement revealed citizens' support for waste management facilities is largely influenced by whether stakeholders and communities feel that they have had a genuine impact on the decision. It is often stated in the literature that this hinges on the degree to which decision outcomes match the substantive and wider goals of society and the extent to which the public is given an equal opportunity to contribute in all areas of decision-making (Petts 2008, 2001; Parkinson 2003; Dryzek 2001; Snary 2001; Rowe and Frewer 2000; Beierle and Cayford 2000; Pratchett 1999; Estlund 1997; Petts *et al.*

1996; Crosby 1995; Petts 1995). This was a main issue emerging from the research: public involvement is most beneficial if the right processes are set up for effective communication, which 'strengthens groups and avoid stand off or impasses' (Chapter 7).

In order for the output of a procedure to have a genuine impact on policy, and build trust in institutions, some flexibility in closing discussions is necessary to allow all stakeholders a fair chance to hear others and be heard, and to bring forward additional information, concerns and perspectives (Stern and Fineberg 1996). Some authors (e.g. Newig and Fritsch 2009a and b) suggest this may convince participants that the process is fair and legitimate, thus increasing acceptance and implementation of policy. Examples of analytical-deliberative processes reviewed (Chapter 3) demonstrate different take-up of the end-results. This disparity is associated with the level of regulatory and institutional support for the process. Usually participatory and deliberative approaches convened by entities outside of legislative and governmental bodies suffer from a lack of regulatory and institutional support (Chapter 3). Local and international experiences with citizen juries and CACs indicate the direct outcome of such processes is a non-binding recommendation which may or may not be adopted (Chapter 3).

Nevertheless, statutory requirements for public involvement in waste management acts as a disincentive for involving the public in the problem framing and option evaluation stages (Chapter 2). This implies any analytical-deliberative initiative that involves the public at the early stages of strategy development and facility planning would suffer from a lack of regulatory support, whereby there is insufficient funding to support such events and may therefore require local authorities to fund these independently. Although a few local authorities in the study displayed a willingness to do so, the vast majority support engaging the general public during consultation - i.e. after the draft strategy is prepared (Chapter 7). This excludes the general public from the framing/option evaluation stages and from actively contributing to technical analysis; upholding a strict separation of deliberation and analysis, which introduces significant institutional barriers to developing analytical-deliberative processes.

8.5: Conclusion

The views and opinions of participants reveal that many different and valid perceptions of waste management issues exist and deliberative and participatory processes for decision-making, planning and problem solving will only be effective if the diverse perceptions of, and connections with, the waste management problem are represented. The age-old presumption of the deficit model (Bäckstrand 2003; Petts 1994; Wynne 1993) is gradually being overturned with the realisation that citizens' values, through deliberation and synthesis, need to be incorporated in decision-making. This does not, however, imply 'anything goes', but instead highlights the critical need to involve a wide range of stakeholders and the public in the development of strategies and plans, rather than having them merely consulted on already drafted proposals.

The privileged position of scientific expertise in the development of waste policy and plans is undermined by a more discerning public who question the ability of experts to adequately assess the social impacts and effects of the strategy and facility proposal, giving rise to questions of its authority in legitimising decisions. The findings suggests that over-reliance on expert knowledge as the basis for decision-making (particularly the selection of installations and siting of waste management facilities) has the potential to stimulate greater public objection to waste facilities and create delays in the planning process. While this encourages local authorities to pursue a more fundamental, constructive engagement with communities and stakeholders, the potential barriers to an analytical-deliberative process are embedded in existing regulatory and institutional structures, the technocratic policy culture for decision-making and the level of politics inherent in waste management practice.

Nevertheless, experiences with analytical-deliberative processes suggest there are inherent opportunities in adopting the approach including: improvements to risk characterisation, public trust and confidence in decisions and decision makers, improvements in the quality of technical assessment processes through expert-citizen deliberations, and the potential to gain the acceptance of stakeholders and communities and thus reduce opposition to waste facilities.

While there is wide support for the use of deliberative and participatory methods to involve communities during facility planning, there is some scepticism (primarily among local authorities) concerning the potential to involve the public during the early stages of strategic planning, where citizens have had less interest and influence in decision-making. Several suggestions were put forward for improving the willingness and ability of citizens to engage at the strategic level; however, most local authorities conceded that the main benefit of deliberative and participatory methods is the opportunity to find an acceptable balance between regional needs and local impacts. This is evident in local authority support for the use of community liaison groups largely on the basis that it increases opportunities to trade off impacts to the local community during facility planning. The research suggests that the 'right level of public involvement' depends on the type of facility and local situation, but the main barrier to adopting more deliberative and participatory approaches is creating effective dialogue in a regulatory culture where participatory democracy is not the dominant political ideology. Current experiences in the UK and abroad suggest the aim should be to improve the effectiveness of existing practice by drawing upon both traditional and deliberative forms of engagement that enhance representation of interests around the problem. The research revealed a need to ensure these approaches are adequately balanced and integrated with equal opportunities for participants to influence decision-making. Nevertheless, the main issue appears to be the level at which this can occur early on in the process (and specifically at the strategic level).

The next chapter includes recommendations on the use of analytical-deliberative processes in a UK waste management context.

Chapter 9: Analytical-Deliberative Framework: Recommendations for Waste Management Decision-Making

This chapter focuses on the premise for analytical-deliberation in different waste management situations. It proposes a procedure for negotiating the level and mode of public involvement and argues that deliberation ought to be context-dependent and 'fit-for-purpose', allowing greater inclusivity for contentious issues and high levels of uncertainty regarding decision outcomes.

9.1: Framework for adopting an analytical-deliberative process

Adopting an analytical-deliberative process requires consideration of how to engage stakeholders and communities in the development of waste management policy in a way that goes beyond consultation, or participation in current decision-making structures, to facilitate a more iterative communication process between policy officials (experts) and the public. Policy should be developed and implemented on the basis of strong scientific evidence, taking into account scientific uncertainty, as well as public attitudes and values (Chapter 2).

While the analytical-deliberative approach presents a more participative decision process, it should not be considered a treatment applied to representative decision-making; rather, it should be interpreted as a process that finds a balance between representative and deliberative approaches. In this regard, stakeholders engaged in the decision process deliberate over social action to boost communicatively generated power, which in part complements administratively generated power to improve upon perceptions of legitimacy, trust, credibility of institutions and fairness of process (Chapter 3).

The key considerations for adopting an analytical-deliberative process are: 'who to involve', 'at what level', 'what methods to use', and 'how to ensure it is suited to the decision context'. The discussion about opportunities and barriers to adopting and analytical-deliberative structure (Chapter 8) was useful in contextualising its potential for waste management decision-making. In this chapter the findings are further synthesised to suggest key principles for adopting the approach..

9.1.1: Who to involve?

The decision on who is selected to participate in analytical-deliberative processes is very important and has a significant impact on the legitimacy of the process. The selection of participants centres on the relevant interests and values stakeholders bring to the table and the roles they play in the process. Specifically the considerations are (a) who is interested in and affected by the decision, (b) the potential for controversy, and (c) the level of representation of interested and potentially affected parties (Chapter 8).

Who is interested in and potentially affected by the decision?

A value judgement is used to define interested and affected parties and decide who needs to participate in waste management decision-making. This usually calls for an assessment of the range of interests, agendas and knowledge bases (e.g. local, expert and procedural) and the level of representation of interested and affected groups needed to establish a fair and equitable decision process.

Evidence from the research suggests a desire for public groups to take a more active role early in the decision process. However, if public input is to be considered meaningful then it is important that those participating be representative of a wide cross section of the community, and more importantly, include the participation of ordinary citizens, politicians and the media to add credibility to the process and improve upon the transparency and accountability of the decision and the decision makers.

Questions regarding the kind of expertise to involve in the process were implicit in the level of concern about the impartiality of technical experts (namely the waste management company) and their ability to prioritise local concerns when evaluating waste management options. These concerns reinforce suggestions in the literature to recruit a wide range of expertise, particularly during consultation on the waste strategy, so there is some assurance of a more comprehensive evaluation of the choice of technology, which can go a long way in enhancing trust in technical experts and the institution (i.e. local authorities).

The potential for controversy

Often the type of technology or facility site and the local situation (two interrelated elements) influence the level of controversy around waste management decision-making. The local situation refers to the social context in which public involvement takes place, where for example, a history of poorly operated waste facilities and a negative image of the technology may increase the potential for controversy (Chapter 5).

An assessment of the nature of the risks should capture conditions in the locality that increase the potential for controversy. Hence, if the waste problem can be framed as a risk or, to a lesser degree, an uncertain problem that is narrowly defined (Chapter 2) it may be more appropriate to restrict participation to a representative group of stakeholders to obtain relevant information about the risk. On the other hand, if the problem is ambiguous and includes social issues that are more broadly defined (Chapter 2), it may be more appropriate to extend participation to all stakeholders and the public to engage dissent and differences and determine the limits of what could be considered reasonable and acceptable within the plurality of interpretations.

Representation

The framing of waste management issues in a more socio-technical context means that most decisions will require the involvement of a wider group of stakeholders and citizens earlier in decision-making. An important question to emerge from the research is how to ensure those participating represent the concerns and values of all interested and affected parties. This is exemplified by the challenges local authorities face in determining whether, what they perceive as, the 'hard-line' environmental lobby groups represent the interests and values of the wider community, who are often not direct participants (Chapter 7).

Suggestions that emerged from the research include the need for a more structured approach to recruiting participants, which must involve a more careful selection of interested and affected parties that guarantees a good representation of the public (or community) and ensures everyone is given an equal opportunity to participate throughout the decision process (Chapter 7). As such it is important that stakeholders and public groups are selected on the basis of their interest in waste management to

ensure discussions are focused on local or regional needs that are of concern to a wide cross section of the community instead of more personal issues that interest individual fractions of the community. This reduces the potential for conflict and allows for the development of different ideas, learning and new ways of looking at the problem. More importantly, it increases the potential for stakeholder and public input to be taken seriously by local authorities, leading to outcomes which are of public benefit.

9.1.2: What level of public involvement?

The fundamental issue for local authorities is deciding how much public involvement is necessary for the waste strategy or facility proposal to have the legitimacy it requires for implementation. This is situation dependent where some decisions will require greater levels of public involvement than others. For instance, in cases where there are low levels of trust or confidence in local authorities (and waste management operators) the level of public involvement should be adapted to encourage greater social interaction and trust building between parties. Similarly, the level of public involvement should be adapted to resolve conflict, particularly in situations where there is great uncertainty and ambiguity around the waste problem (Section 9.1).

Optimising the level of public involvement in situations of conflict allows policy makers to understand and explore opposing perspectives and resolve issues to find common ground or develop novel solutions. Ostrom *et al.*'s (1993) rules for optimising the conditions of public involvement (Table 3.8) are adapted by the researcher to include the opinions of stakeholders across the waste sector. The rules assume collaboration between public representatives, technical experts and policy makers is on equitable basis throughout the decision process, while recognising the complexity of policy problems facing local authorities and the political and legal restrictions to giving citizens full control of decision-making:

- *boundary (inclusion of relevant interest groups)* – all stakeholders and citizens interested and affected by the decision should be given the necessary

incentive to take a more active role in decision-making (i.e. recognising and rewarding citizens in the community who are willing to get involved)

- *authority (civic rights to participate)* - stakeholders and citizens should have the right to contribute to framing the issues, setting the agenda, identifying the options and influencing the final decision

- *information and interaction* - scientific and local information is relevant to decision-making, and stakeholders and the public should be provided with relevant information and supported in processing technical data and collecting their own information (i.e. given the necessary resources, training and time to collate and analyse information, debate issues and deliberate over potential outcomes)

- *aggregation (influence on decision-making)* – the final decision should be based on negotiations between interested and affected parties to identify a workable, relatively fair solution that the vast majority of parties can accept.

Optimising the level of public involvement provides opportunities to open up the decision process and admit a wider range of perceptions of complex issues to gain a richer understanding of the risk situation and a more holistic assessment of options and potential outcomes, thus creating a stronger foundation for decisions.

9.1.3: What methods (and techniques) to use?

The challenge is finding the best means of combining analysis and deliberation to enhance conditions for successful participation: social interaction, mutual learning and trust building (Chapter 3). The important questions (and insights) from the research and prevailing literature relate to:

- the diverse and competing interests around waste management issues
- the extent and structure of expert-citizen deliberations (e.g. opportunities for social interaction, mutual learning and trust building)
- issues of trust and legitimacy (e.g. the potential for citizens to have a genuine impact on waste policy or facility proposals).

Diverse and competing interests around waste management issues

The way that the waste problem is framed partially determines the way risks are analysed and understood, so an early decision is required on whether the nature of the problem necessitates extensive deliberation integrated with analysis. This calls for an early assessment of the risks or level of uncertainty (or ambiguity) around the waste management problem. In cases where there is potential for controversy both analysis and deliberation may highlight the concerns and values of different interest groups and formulate exclusionary criteria that allow for the consideration of diverse, sometimes competing, objectives.

The level of ambiguity implicit in debate around local authority priorities and goals for sustainable waste management, particularly in relation to EFW incineration (Chapter 7), raises awareness of potential framing issues which emphasises the need to open the decision process to a wider group of stakeholders and public groups (Chapter 8). Evidence from the research suggests there is growing support for the use of deliberative and participatory methods such as community liaison groups during facility planning as there are greater opportunities to find an acceptable balance between regional needs and local impacts. The objectives of engagement from pre-application stage to construction are commonly associated with discerning citizens' opinions regarding the characteristics of facilities and identifying what alternatives are more likely to be acceptable (Chapter 7).

However, emerging support for a strict separation between (citizen) deliberations and (expert/scientific) analyses at the strategic level poses important methodological problems for adopting analytical-deliberative processes.

Extent and structure of expert-citizen deliberations

There is a need for greater awareness of the benefits of public representation and cultural forms of rationality in framing waste issues, identifying and evaluating waste management options at an earlier stage in decision-making. Both deliberation and analysis are useful for managing the process and encouraging mutual understanding between participants. The research reveals specific considerations that include: (1) deciding on the relevant information and expertise to inform the process,

(2) ensuring access to information, its communication, interpretation and assessment of validity claims, and (3) agreeing on a procedure for reflection and closure.

The relevant information and expertise to inform the process

The research reveals the need for experts and citizens to be given equal opportunity to put forward information as both expertise and local knowledge is widely recognised as important to the debate around strategic and local planning issues (Chapter 7). The range of expertise should be balanced, particularly where controversial facilities are proposed, so that there is equal consideration of national and local issues (Chapter 8). This may include engaging expertise from various disciplines covering a wide range of values (e.g. economic, environmental, social, political and cultural) as well as local knowledge that exists within formal community groups or less organised groups (e.g. resident associations, local businesses and youth and recreational groups).

Access to information, its communication, interpretation and assessment of validity claims

Effective and cooperative stakeholder and citizen involvement necessitates clarity of information and a level of interaction between experts and citizens to facilitate organisational learning and cultural change in constructing public understanding of waste management issues. The research reveals a need for more interactive methods of communication, specifically as it relates to delivering technical information. Adopting visual aids in presentations or prototypes (mock-ups) of technologies may allow citizens to better visualise facilities – this has been particularly effective for consultation on facility proposals (Chapter 7).

More ideas on how best to conduct consultation may be solicited from the public to determine the best means for delivering technical information, soliciting feedback and actively engaging citizens in discussing issues and generating information. This ensures discussions are inclusive and may stimulate effective public involvement in situations where a controversial facility is proposed or there is knowledge of public dissent related to experiences of poorly operated facilities.

A primary objective for local authorities is to develop evaluation criteria that the vast majority of stakeholders will consider a fair and equitable representation of all interests and values that exists in the problem situation. However, the tendency of local authorities to privilege technical expertise over public knowledge insulates the problem framing stage (and others such as criteria development) from citizen interaction, restricting opportunities for social interaction and mutual learning. A significant cultural change is required for local authorities to recognise the benefits of public representation early in decision-making and to consider public understanding of complex waste management issues as capable and legitimate.

There should be opportunities for stakeholders and citizens to question experts and debate issues which require a high level of interaction between parties. In analytical-deliberative processes it is desirable to bring citizens' concerns into expert discourse through the development of exclusionary criteria that are then used to evaluate options. However, the evaluation of options ought to be facilitated to ensure there is an impartial assessment against comprehensive criteria that reflect optimum integration of quantitative and qualitative information. Hence the role of the facilitator is multifaceted and requires an individual with the necessary experience, communication skills and knowledge of waste management issues (Chapter 7) to enhance citizens' understanding of the overall process and build the necessary lines of communication that support and facilitate the public's role.

An agreement on the procedure for reflection and closure

It is important that there is sufficient debate around issues and that each party is given the opportunity to bring forward new information and the forum to raise new ideas before discussions are brought to an end. Public involvement initiatives may be constrained by time and resource issues, so there may be limited scope to be innovative with deliberative groups. However, agreeing a procedure for timely, effective and reasonably open-ended discussions will reduce potential conflict associated with public expectation (Chapter 8).

To keep discussions focused, it may be beneficial to establish a clear remit for the public from the onset. However, this should be done in consultation with the community so management of the process is open and inclusive, thus reducing

potential problems later on. Considering public consultation events are usually tied to local authorities' agenda and time-frame some negotiations may be required to balance citizens' expectations with institutional limitations such as cost, time and other resources.

In co-ordinating expert-citizen deliberations it would be beneficial to design and agree an intensive communications protocol that outlines the role of different parties, the information contributions and the structure and timelines for information exchange and discussions, and also the means by which quantitative and qualitative information is integrated to evaluate options. The protocol should allow citizens the freedom to address the legality of the process while maintaining compliance with specific legal and administrative provisions for decision-making (e.g. making it clear who is accountable for the decision outcome). An independent facilitator may have primary responsibility for designing the protocol with adequate input from local authorities, experts and citizen groups. Independent facilitation ensures the protocol is adhered to by all parties, thus providing a more credible and transparent process.

Issues of trust and legitimacy

The existence of institutional trust issues resulting from a history of conflict or lack of trust between local authorities (or the waste contractor) and the local community may require increased analytical attention to issues such as social equity and fairness of process (Chapter 8). Public involvement initiatives may achieve perceptions of fairness and legitimacy if stakeholders and citizens are given equal opportunities to act meaningfully in all aspects of the decision process (i.e. setting the agenda, establishing procedural rules, selecting information and expertise to inform the process and assess validity claims).

Local authorities must understand both the local and regional impacts of their decisions to provide for greater credibility of the policy process. They may address issues related to trust and legitimacy by being more open about how public views and concerns influence decision-making. This requires a more flexible attitude from local authorities and a willingness to change aspects of the plan or proposal to meet expectations of a fair, equitable and legitimate process (Chapter 7). However, in

situations where citizens' views and opinions cannot impact on aspects of the plan or proposal, then there should be clear communication as to reasons.

9.1.4: Is the level of public involvement suited to the decision context?

The research findings (Chapter 7) revealed the most important factors that affect decisions around the level of public involvement are:

- *The type of facility (or technology) proposed* - for example, the nature of associated risks or level of uncertainty and ambiguity around the technology and the potential for controversy

- *The local situation* - for example, the sensitivity of the locality (e.g. urban vs. rural area), the history of local waste management practice, and residents' opinion on waste facilities.

In theory, the nature of the problem (and type of technology proposed) clarifies the need for and informs the scope of public involvement. For instance, developing or reviewing the waste policy (or seeking planning approval for facilities) involves the assessment of waste management technologies associated with different types of risks. The most common, which are discussed in detail below, are: (1) uncontroversial technologies associated with risks that are largely technical in nature and narrowly defined, (2) new or innovative technologies that have high levels of uncertainty regarding the decision outcomes, and (3) controversial technologies that have high levels of ambiguity inherent in how the problem is framed (Chapter 2.5).

Additionally, the social context (e.g. the local situation) should be assessed to identify interested and affected parties and to uncover the potential for controversy. The level of stakeholders and citizens' engagement can then be designed to meet targeted objectives related to normative, epistemic or instrumental goals of participation. The success of public involvement activities may be measured against factors associated with the process of engagement (e.g. legitimacy and credibility of the institution and its representatives) and the more substantive and quality related outcomes of the process. The substantive factors include measures of efficiency and effectiveness, while the qualitative factors are related to stakeholder satisfaction with

the participation process and this includes opportunities to enhance social interaction, mutual learning and trust building (Chapter 3).

The emphasis on analysis and deliberation is guided by targeted objectives, although process and outcome considerations should largely influence the balance achieved between analytical and deliberative elements in any public involvement activity. The procedure for scoping the level of public involvement (and the techniques for integrating analysis and deliberation) is context specific and largely theoretical in approach. It synthesises the information above and discusses the following:

- the nature of the waste problem
- premise for public involvement
- level of public involvement
- benefits of public representation.

Uncontroversial technologies

Nature of the problem

Non-thermal technologies are considered preferable at the local level where, there are assumptions that the size of facilities are smaller (and hence more desirable to local communities), avoiding controversial issues associated with larger facilities such as EFW incineration (Chapter 8).

The adoption and implementation of such technologies are associated with largely technical issues that are narrowly defined. For example, issues concerning wider environmental and economic impacts and the regulatory and institutional implications of the technology (e.g. compliance with LATS) tend to dominate technical discussions. Other issues around social responsibility such as public education on waste reduction and recycling are also likely to be important (Chapter 5). Nevertheless, the difference in priorities for waste management, evident in the level of disparity around stakeholder aspirations for recycling/composting targets, emphasises the need to align different values and preferences (Chapter 7).

Premise for public involvement

The motivation for involving the public in decisions around complex technologies is associated with opportunities for aligning public values and preferences for waste management more closely to those represented within the process. For example, the research suggests there is some potential to align values and preferences around social responsibility, although significant questions remain regarding who should bear the responsibility for public education (i.e. local or central government) and whether incentive schemes are a better alternative to education and public awareness programmes in encouraging householders to be more responsible (Chapter 5). Nevertheless, the concerns around social responsibility have the potential to be controversial (as evident in the debate regarding variable charging) so the decision process may need to be more inclusive where all interested and potentially affected parties are given an equal opportunity to participate.

Level of public involvement

Where the issues around the waste policy (or type of facility) are largely technical in nature and narrowly defined, there is more appeal to institutional authority (and expertise) to assess the risks and reduce negative impacts on local communities. In these situations, local authorities may want to limit participation in the early stages of decision-making (i.e. framing the issues, setting the agenda and identifying the options) to internal stakeholders and statutory consultees, and then open it up to incorporate public views or comments on pre-defined options. At minimum, this raises the issue in the public's consciousness and provides opportunities for public education by responding to questions or comments raised at consultation events (e.g. public meetings or workshops). The use of information dissemination techniques (e.g. brochures, fact sheets, media stories, advertisements and websites) may reach a wider range of interest groups and enhance consultation events in terms of the level and quality of participation.

The level of interaction between participants is limited to giving people an opportunity to consider and respond to proposals, where the issues are well defined and potential solutions determined. In this situation, there is more reliance on expert knowledge in assessing strategic and local planning issues. However, if local authorities are required to represent public views on potentially controversial issues

(e.g. variable charging) they may find that an informal approach to consultation can add value by providing 'upfront' input which allows communities and external partners to participate in shaping the strategy or facility proposal before, rather than after, the draft document is produced.

Benefits of public representation

Formal consultation events satisfy the public's constitutional rights to participate in decision-making, whereby the benefits are associated with widening access to the decision process and improving public understanding around wider environmental and economic issues. Consultation events are less costly as they restrict participation to a small group of participants (e.g. internal stakeholders and statutory consultees) and utilise cost-effective techniques such as information dissemination exercises to widen public access to the decision process. The strategy also means that decision makers have more control of the process and are able to impose strict time frames for public engagement activities.

New or emerging technologies (high level of uncertainty around the problem)

Nature of the problem

The empirical data reveals new or emerging technologies (e.g. gasification, pyrolysis and mechanical biological treatment) are seen as publicly acceptable because they appear to be 'new', 'cutting edge' and 'cleaner', thus avoiding local environmental issues commonly associated with EFW incineration (Chapter 8). The limited experience with new or emerging technologies in the UK means there is little knowledge about the potential risks and social hazards of these technologies - a problem that dominates the discussion at the local and national policy level (Chapter 7). The adoption and implementation of these technologies is largely related to technical issues that are narrowly defined but with higher levels of uncertainty compared to, for example, non-thermal technologies for biodegradable waste.

The research suggests there are additional concerns associated with high costs, low potential for energy recovery and other issues that make it difficult to secure funding for these technologies (Chapter 5). The potential for controversy is associated with the high costs and concerns around the reliability of the technology and, also, with

the tendency of the public (and politicians) to favour these technologies on the grounds that they potentially increase recycling rates and are a more acceptable option compared to EFW incineration. The lack of knowledge about the risks and different perspectives on the issues emphasises the need to gather information and insights about the problem to better inform the decision.

Premise for public involvement

Public involvement in decisions around new or emerging technologies provide opportunities for gathering essential information about wider environmental and economic issues and insights around social concerns to develop a more effective and agreeable strategy or facility proposal. Where there are high levels of uncertainty regarding decision outcomes, there is a tendency to objectify risks, illuminating expert calculations as somehow more real or valid than the perceptions of the rest of the public (Kasper 1980). However, problems regarding the ability of technical experts to adequately deal with public concerns (Chapter 9) mean it is important that the public is able to contribute to the policy (or planning) process at an early stage so as to influence the framing of issues in developing the waste strategy or facility proposal.

Level of public involvement

Where there are high levels of uncertainty regarding decision outcomes from the waste policy (or proposed facility), there is more appeal to cultural forms of rationality at an earlier stage in decision-making (i.e. framing the issues, identifying and evaluating options). In these situations, local authorities should extend the boundaries of participation to obtain relevant information about the risks and explore concerns related to social, cultural, political and other relevant interests.

The level of public representation largely depends on the extent of uncertainties around the technology and potential for controversy. However, opening up the process (from an early stage) to include a representative group of interested and affected parties may be sufficient for issues that can be framed as a risk, or to a lesser extent, an uncertain problem (that is narrowly defined). Involving interested and affected parties in early deliberations adopts a more inclusive process, which can be

effective in resolving issues if deliberative and participative methods are relevant to the experience of communities and fit-for-purpose.

Greater levels of uncertainty around the technology requires the engagement of a wider group of stakeholders to frame the issues so that the interests represented are comprehensive and include a wide range of values, principles and concerns. The evidence from the research suggests the involvement of ordinary citizens is prerequisite to getting a good representation of communities and the range of people interested and willing to participate (Chapter 7). The level of interaction between participants may be tied to local authorities' agenda and time-frame but there should be adequate opportunity for the public to put forward information as both expertise and local knowledge is important to the discussion. Establishing a remit for public involvement (in consultation with stakeholders and citizens) may allow local authorities to control the process, and impose a relatively fixed time frame for public engagement activities.

Benefits of public representation

The benefits involve working directly with stakeholders and citizens to discuss issues constructively and to solicit views with the aim of gathering public knowledge, ensuring their concerns and values are fully understood and addressed. The advantage over the traditional consultation approach (i.e. using methods such as public meetings or surveys) is the opportunity to solicit a more holistic view of waste management issues, particularly where input is required at an early stage in decision-making. For example, the use of community advisory committees, workshops or citizen juries may enable local authorities to work collaboratively with small groups of stakeholders and community representatives to develop criteria that reflect the interests of the community and informs decision-making.

Controversial technologies (high level of ambiguity around the problem)

Nature of the problem

The research reveals the impacts associated with controversial technologies (e.g. EFW incineration), from a citizen perspective, are related to public perception of the risks to human health and concerns around local environmental issues (e.g.

restrictions on recycling, transport and other amenity impacts). Opinions from a regulatory and institutional perspective relate to public opposition to waste facilities and the associated impacts on the planning process. The difference in stakeholders' perspectives highlights the level of ambiguity in framing the issues and defining the nature of the problem (Chapter 8).

The research also suggests that the lack of trust in public officials (and their representatives) that attribute and distribute risk among communities raises concern associated with social equity and fairness (Chapter 9), thus creating a level of controversy around the selection and installation of technologies, particularly EFW incineration facilities. The level of ambiguity around the concerns and values of different interest groups highlights the need to ensure dissent and differences are fully engaged and understood.

Premise for public involvement

Public involvement in decisions around controversial technologies is necessary to expose dissent and disagreement and clear up misunderstandings around the nature of the controversy so as to determine, as suggested in the literature, the limits of what could be considered reasonable (or acceptable) within the plurality of interpretations (Chapter 3). The involvement of a wider group of stakeholders, specifically in consideration of the risks, clarifies the views of various participants and the level of assessment necessary to achieve an adequate balance between regional and local needs, thus building credibility and trust in the process.

Level of public involvement

Where there are high levels of ambiguity (or disagreement) regarding the goals and priorities for waste management, there is more appeal to cultural forms of rationality at an earlier stage in decision-making (i.e. framing the issues, identifying and evaluating options). In these situations, local authorities should extend the boundaries of participation to establish genuine collaboration between public representatives, technical experts and decision makers. The objective is to resolve conflicts over the admissibility of evidence; understand and explore opposing perspectives and aggregate and interpret different forms of knowledge to solve problems and find common ground.

The concerns are associated with the danger of prolonging problem framing to the extent that it becomes difficult to close discussions in a timely manner, thus delaying decision-making. Additionally there is a danger of incorporating so many perspectives of the problem that it becomes difficult to negotiate a common definition of the problem and agree a set of objectives for taking action (Chapter 8). The empirical evidence suggests that establishing an intensive communications protocol (in consultation with stakeholders and citizens) should clarify the remit for public involvement and allow local authorities to control the process, imposing a flexible time frame for public engagement activities.

Opening up the process to a wide range of interested and affected parties ensures all relevant perspectives on the issues are captured early to inform analysis and deliberation. Issues of trust and legitimacy may be addressed by giving participants equal opportunities to act meaningfully in all aspects of the decision process. Involving a wide range of expertise (and independent facilitation) can help build trust and encourage positive input from communities in situations where trust (and the credibility of the institution) is at stake.

Highly interactive deliberative groups (e.g. deliberative fora, community advisory committees) are suitable to provide a forum for stakeholders and citizens, working in collaboration with experts to combine technical facts with public values into a set of conclusions and recommendations (Chapter 3). The integration of quantitative and qualitative information will require a trusted and accomplished facilitator to design an appropriate mechanism for converting and conveying information between parties and ensuring impartial assessment of options against a comprehensive list of criteria (Chapter 8).

Benefits of public representation

The benefits include the opportunity to establish genuine partnerships with communities to resolve conflict, promote social interaction, mutual learning and improve public confidence in local authorities (and their representatives). The advantage over the traditional consultation approach is the potential to match desires for more direct forms of democracy, openness and transparency and also the possibility of saving money and time at a later stage of the decision-making process.

9.2: Applicability of the framework

A key output from the research is an empirical framework (Table 9.1) that sets out three 'idealised' strategies for negotiating the level and mode of public involvement in relation to the nature and context of waste management decisions. The principles in the framework are not intended to be 'hard and fast' rules deemed sufficient in addressing the highly complex and situational nature of the waste management problem. Rather, the framework should be treated as a generic tool that captures and builds on theories of public involvement and the experiences of practitioners to offer guidelines for integrating analysis and deliberation in different decision situations.

In discussing the applicability of the framework, it is important to clarify the scope (and interpretation) of an analytical-deliberative process in a waste management planning context. As a general principle, the analytical-deliberative process offers a comprehensive assessment of the risks associated with a proposed policy or facility using a range of methods including traditional forms of engagement and in-depth, facilitated discussions between representative groups of interested and affected parties. The aim is to consider diverse, sometimes competing, interests, values and principles in negotiating exclusionary criteria that the vast majority of participants accept for defining effective (and innovative) waste management solutions.

The framework proposed (Table 9.1) operates on the basic assumption that the decision on the level (and extent) of deliberation (in combination with formal analysis) can be negotiated, based on the nature of the problem and the social context of decision-making (Section 9.1). This necessitates an assessment of the risks or level of uncertainty and ambiguity around the technology and range of interests, values and principles regarding the goals and priorities for waste management. The careful consideration of these factors establishes the premise for public involvement and the benefits of optimising public representation.

While further research is recommended for an in-depth assessment of how the framework can be applied (Chapter 10), the following discussion (Section 9.2.1 to 9.2.3) reflects on its general applicability at different stages of decision-making.

Table 9.1: Analytical-deliberative framework: recommendations for scoping public involvement during waste management decision-making

Policy options (or type of facility)		Complex (and uncontroversial) technologies	New or emerging technologies	Controversial technologies
Nature of the problem (or type of risks)		Largely technical and narrowly defined	Largely technical and narrowly defined but with greater levels of uncertainty	Ambiguous problem; includes social issues that are more broadly defined
Premise for public involvement		Align values and preferences represented within the process closer to that existing within society (normative)	Provide essential information and insights about the problem to develop a more effective/agreeable strategy or proposal (epistemic)	Expose dissent and disagreement to clear up misunderstandings and negotiate a more effective/acceptable solution (instrumental)
Level of public involvement	Boundary	Restricted public involvement - open to internal stakeholders and partners, and statutory consultation bodies	Intermediate public involvement - open to internal stakeholders, statutory consultation bodies and a representative group of interested and affected parties	Extensive public involvement - open to internal stakeholders, statutory consultation bodies and a wide range of interested and affected parties (including the general public)
	Authority	Participants have the right to question or object to the strategy/proposal	Participants have the right to frame the issues and set the agenda	Participants have the right to frame the issues, set the agenda, identify options and influence the strategy/proposal
	Information and deliberation	Detailed strategy or proposal (draft) is provided for comments usually at public meetings (or via surveys or focus groups). Little interaction between participants	All relevant and available information is provided. Use of deliberative techniques (CACs or citizen juries) and formal consultation to gather public knowledge. Interaction between participants follows a pre-defined (fixed) remit	Mostly technical information provided. Use of deliberative techniques (CACs, conflict resolution techniques) and formal consultation to explore perspectives, debate and resolve issues. Interaction between participants follows a pre-defined (flexible) remit
	Aggregation	There is some reflection on comments from the consultation process	There are detailed comments on how the concerns and values of participants are addressed	The concerns and values of participants have changed or influenced several elements of the strategy/proposal
Benefits of public representation	Process	Ensures accountability and enables local democracy; allows for a timely and cost-effective process	Builds institutional credibility; meets expectations for epistemic competence; potentially responsive process	Meet expectations for a fair and equitable process; responsive, legitimate (open and transparent) and considered epistemic/ethically competent
	Substantive outcomes	Emphasis on developing effective solutions	Emphasis on developing effective and potentially agreeable solutions	Emphasis on developing effective and potentially acceptable solutions
	Quality outcomes	Improve public understanding and raise public awareness	Establishes dialogue and promotes collaboration to reconstruct ideas around the deficit model of public understanding	Resolve conflicts, promote social interaction, mutual learning and trust building

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9.2.1: Waste strategy development

There are inherent benefits to adopting analytical-deliberative processes for engagement during waste strategy development. These include - but are not limited to - the opportunity to reveal the level of ambiguity around the goals and priorities for waste management with the primary aim of reconciling different and valid perceptions of the risks (or impacts) associated with the policy or technology.

There are varying degrees of deliberation (integrated with analysis) proposed depending on the nature of the waste management problem and policy context (Table 9.1). Intermediate to extensive levels of deliberation calls for a more collaborative approach, where stakeholders and communities take an active role in structuring the debate, determining the criteria and participating in option evaluation. However, there is some scepticism (primarily among local authorities) concerning the potential to adopt inclusive engagement processes during strategic planning. This is associated with a perception that citizens have less interest and influence on strategic issues, so any inclusive approach would suffer from poor public representation, where those who engage reflect the usual interests (e.g. environmental lobby groups who local authorities perceive have fixed agendas). Another factor that may act as a disincentive is the existence of institutional trust issues resulting from a history of local conflict or lack of trust between local authorities (or the waste contractor), which may affect the level of interaction between these groups and restrict organisational learning and cultural change needed to correct past institutional assumptions about public ignorance and incompetence.

9.2.2: Facility planning

As public involvement moves from strategy to specific site applications, issues often become more emotive as local residents are more engaged in the process. The most contentious issues are usually around fixed parameters (perhaps set by policy or location) which are often non-negotiable, but there are elements of the proposal such as the design of facilities and routing of transportation, that may be negotiable.

Local authorities suggest there is much more support for analytical-deliberative methods at the facility planning stage, mainly on the basis that it offers an opportunity to find an acceptable balance between regional needs and local impacts.

Though the same could be said of the strategic level, the benefits appear to be more apparent during facility planning, where local authorities feel there are opportunities to address problems around risk perceptions, fairness and equity. These factors are commonly associated with concerns about local impacts, long-term consequences, institutional trust and economic disadvantages associated with where sites are located. The immediacy of the decision may also explain local authorities' support for the use of analytical-deliberative processes during facility planning, as there is greater awareness of the need to engage groups to avoid impasses and stand-offs with the public, which may create delays, or result in the refusal of planning applications.

9.2.3: Practical implications

The support for more analytical-deliberative processes will require sponsors to demonstrate how expert-citizen deliberations foster progress on controversial issues and lead to fundamental change in individuals, communities and institutions. While extensive forms of deliberation have the potential to resolve disputes, build trust and generate public support, traditional local authority institutions may be reluctant to engage in dialogue with communities as it exposes them to public review and accountability. This technocratic culture apparent in institutional structures for waste management often imposes narrow institutional framings that reflect strategic interest-based manipulation of issues, thus closing down opportunities for wider debates. Hence a significant shift in culture is necessary for local authorities to realise the potential of more inclusive processes; this calls for political actors and civic society to collaborate in institutionalising public participation in both strategic and local planning structures.

Communicating the practical benefits of more inclusive forms of engagement is particularly difficult in a climate where planning and policy delays are hindering development and implementation of waste management infrastructure. In this situation engagement is often seen as time-consuming, costly, politically risky or ineffective so there are less opportunities to link deliberation to institutional or policy change. Experiences of engagement in the waste sector (Chapter 3) show deliberation is easier to link to individual or small-group change, where there are opportunities to initiate learning processes, create mutual understanding and resolve

conflicts between participants to negotiate more acceptable solutions. Lessons learnt from these experiences suggest a well organised and facilitated process may increase the acceptance and legitimacy of a decision. However, the take-up of the end-results or outputs from the process to a large extent depends on the level of institutional (and political) or legislative support given to the process.

In the current climate of increased local choice where there is growing momentum for deliberative engagement, there is an incentive for local authorities to 're-model' traditional consultation techniques to incorporate the language, but not necessarily the practice, of inclusive engagement. Thus, it becomes important to clarify the context for deliberation and the conditions upon which public values may be successfully integrated into technical analysis of options. Adapting the different strategies for engagement (Table 9.1) will require careful consideration of the nature and complexity of waste issues and the local culture and potential for controversy in shaping activities that initiate learning and build trust among participants.

For citizen-deliberations to be effective there must be a clear understanding and agreement on the rules that determine: 1) the relevant information and expertise to inform the process, 2) access to information, its communication, interpretation and assessment, and 3) the procedure for reflection and closure (Section 9.1). The cost-effectiveness, availability of expertise and demands on time and other resources impact on the level of interaction and opportunities for discussions in analytical-deliberative processes, particularly where citizens are given extensive remits through:

- *strategic planning* – contribute to setting policies and targets as well as selecting and evaluating options
- *facility planning* – contribute to identifying concerns and site selection criteria as well as evaluating sites and the design of the facility

Information provided to citizens should include interactive and visual aids that cater for a range of cognitive abilities. There should also be adequate time for deliberations and support offered to citizens to interpret information and to question and challenge evidence/expertise, so as to maximise social interaction and

opportunities for mutual learning and trust building. Inequalities in communicative resources must be realised and addressed. So if participation is to be considered meaningful, the necessary resources (including incentives) should be provided to encourage ordinary citizens to get involved. A mix of deliberative and traditional consultation methods should be combined to establish representative views, increase accountability and enable local democracy. However, it is important that participants in both deliberative and traditional consultation activities are given equal opportunity to influence decision-making.

9.3: Summary

The decision on the level of public involvement required for analytical-deliberative processes to be considered successful involves a range of interrelated questions. The nature of the problem (i.e. type of technology) and the social context in which public involvement takes place are important factors raised through the research. Process and outcome variables tend to dominate how successful public involvement activities are in most evaluative studies and proposed frameworks (Chapter 3) and proved useful in identifying how public representation may be optimised in different waste management contexts.

The level of public representation necessitates questions about who participates, the perceptions and interests represented, the means of engagement and the necessary resources and capacity (i.e. funding, expertise and time) for a more iterative communications process that inherently involves greater innovation and experimentation with deliberative and participatory methods. However, these considerations are by no means exhaustive. The recommendations for public involvement (Table 9.1) assume the decision context is linear. However, in practice the waste management situation is likely to be non-linear and this is considered in discussing the applicability of the framework (Section 9.2) where the focus is placed on the methodological development of the analytical-deliberative process at different stages in decision-making.

Chapter 10: Conclusion

The question posed at the outset of the research (Chapter 1) was a practical one. The approach taken, largely theoretical (and empirical) in nature, involved an assessment of the potential to negotiate the level and mode of participation in relation to the decision context, and to assess the suitability of deliberative and participatory methods within existing regulatory and institutional regimes. In responding to the research question, a mixed methods approach was used to explore the socio-technical nature of the waste management problem to generate a typology of variations in perceptions of waste management issues, and opinions and attitudes to early public involvement. Questions of perception, interests and the decision context were addressed in order to gain an understanding of the different perspectives of participants with much emphasis placed on investigating the social conventions, politics and power and the prevailing culture for decision-making.

There are major challenges associated with selecting appropriate technologies to manage municipal waste and securing the necessary planning approval, particularly where community views, political aspirations, policy and financial imperatives collide. In the expected climate of increased local choice, there is much emphasis placed on creating a planning system that correctly distinguishes between local and national issues to deliver facilities (Chapter 2). The empirical findings document stakeholders' opinions on the form of action necessary to improve the deliverability of municipal waste management strategies. Although there were disparities in stakeholders' preference for actions, these suggestions have implications for adopting analytical-deliberative processes in developing strategies and facility plans that achieve an equitable balance between regional and local needs. Key actions identified (Chapter 8) include:

- ***Greater social responsibility*** and awareness of the need for waste facilities. The preferred actions include increasing public education on waste reduction and recycling and adopting a greater number of recycling schemes that include source separated materials (e.g. at kerbside) and collection of food waste. However, there remain some questions about who should take the

responsibility for educating the public on the need for facilities and the importance of waste reduction and recycling.

- More ***acceptable technologies*** that balance the priorities of experts and the community against costs, political and environmental issues. The preferred actions include adopting a broad mix of waste treatment technologies that is approved by government, a more positive national policy towards energy recovery through EFW incineration as a source of energy production, and a national statement on the health effects of EFW incineration facilities.

- ***A more democratic and socially engaging decision process*** that adopts adequate mechanisms to reduce controversy during the siting of waste facilities. The most preferred actions include a more suitable process for distributing the risks associated with siting waste facilities, the implementation of long term strategic decisions that last over the lifetime of several local authority administrations, and the inclusion of named sites in the waste strategy.

The research documents the diverse and competing interests, values and principles regarding the goals and priorities for municipal waste management, which highlights a level of ambiguity implicit in the way that the waste problem is framed. The institutional and regulatory framing of the waste management problem that dominates traditional consultation processes was identified as an issue, where problem framing is constrained due to a focus on government targets with limited potential for citizen and stakeholder input in the development of (innovative) solutions.

The rather dim view (mainly of local authorities) on the possibility for active citizen involvement in problem framing, particularly around controversial technologies such as EFW incineration, poses significant challenges to adopting analytical-deliberative structures that bring together citizens, stakeholders and policy makers in a highly interactive learning process. Consequently, there is a need for greater awareness of the benefits of public representation and 'moral or cultural forms of rationality' as the basis for decision-making, since waste management issues are framed in a more

socio-technical context, which necessitates the contribution of a wider group of stakeholders in the consideration of the nature of risks and the level of assessment required.

It is likely that opening up the decision process to a myriad of interests, agendas and knowledge bases will make it difficult to trade-off objectives in a process perceived as equitable and fair, and arrive at a timely decision, reducing costs and limiting excessive use of resources. However, the involvement of a wider group of stakeholders has the benefit of identifying areas of dissent and differences and ensuring these are engaged and understood (Petts and Leach 2000; Stern and Fineberg 1996), thus increasing opportunities to find more effective and agreeable/acceptable solutions.

The most significant challenge to implementing an analytical-deliberative process is designing an approach that is effective, efficient and appropriate in dealing with technological risks, environmental impacts and economic issues, as well as the social and institutional conditions surrounding waste management decisions. The existence of institutional trust issues between local authorities (or the waste contractor) and the local community may require increased analytical attention to issues such as social equity and fairness of process.

To achieve perceptions of fairness and legitimacy, it is important that the public is given equal opportunity to act meaningfully in all aspects of the participation process (Petts 2006). Where the decision context is likely to change, some flexibility in collaborative relations is also important to ensure engagement remains meaningful for participants (Benneworth 2009). The research suggests a more flexible attitude from local authorities (and their partners) and a willingness to change aspects of the plan or proposal may meet expectations for a fair, equitable and legitimate process.

The research has also demonstrated greater awareness among local authorities of the benefits of engaging citizens earlier in decision-making (e.g. framing the issues, setting the agenda, identifying and evaluating options) where sporadic experiences with deliberative and participatory processes are seen as a means to satisfy citizens' democratic right to participate and to gain their support for waste management

facilities. Local authorities suggest citizens have less interest and influence at the strategic level, so much of the support for early public involvement is at the facility planning stage, where there are more opportunities to trade-off local impacts, thus requiring both technical judgement and negotiation with communities. This attitude confirms suggestions in the literature that the insulation of decision-making (mainly strategic planning) from expert-citizen interaction indicates that past institutional assumptions about public ignorance and incompetence may still hold (Chilvers 2007; Petts 2003), posing important methodological challenges to adopting analytical-deliberative processes.

The framing of waste management issues in a more socio-technical context means that most decisions (whether at the strategic or facility planning level) will require the involvement of a wider group of stakeholders and citizens earlier in decision-making. An analytical-deliberative process provides opportunities for continuous public involvement throughout the decision process, where stakeholders and citizens are given the opportunity to express their views and shape the direction of the waste policy or facility proposal, thus promoting a more fundamental constructive engagement process.

The research suggests the goal for an analytical-deliberative process is not associated with achieving consensus across all interested and affected parties but the idea of negotiating a workable, relatively fair solution that not everybody agrees with but the vast majority can accept (Chapter 5). This raises the question of how to determine the number of interests and level of representation of stakeholders and citizens to include in the decision process. The research confirms both analysis and deliberation may be used to address questions of interests and representation in waste management decision-making (Chapter 9). Analysis determines the legal obligation to involve stakeholder and public groups and provides a reasonable test of parties' claims to be affected by the proposal or plan. Deliberation may be used to determine how much representation each interested and affected party should have in the decision process, who should contribute to the decision-making and what kinds of expertise are relevant and should be included in the process.

The main considerations and inherent benefits of integrating deliberative activities into the waste management decision process are context specific (Bull *et al.* 2010; Chilvers 2009), with greater inclusivity for contentious issues and high levels of uncertainty regarding decision outcomes (Stern and Fineberg 1996; Renn *et al.* 1995). The views and opinions of stakeholders across the waste sector were integral to the research and led to recommendations for negotiating the level or extent of public involvement in different waste management contexts (Chapter 9). For instance:

- In situations where risks are largely technical and narrowly defined, public involvement offers opportunities to align the values and preferences represented within the decision process closer to those within society. This ensures accountability, satisfies citizens' right to participate, improves public understanding and raises public awareness of the waste management problem. In this regard, restricted forms of engagement (with little interaction between participants) may be deemed sufficient a basis for effective stakeholder and citizen engagement.

- In situations where there are higher levels of uncertainty around technologies and the consequences of associated impacts, the aim of public involvement should be to provide essential information and insights about the risks so as to develop a more effective and agreeable strategy or proposal. This builds institutional credibility, meets expectations for epistemic competence in decision-making and promotes collaboration to reconstruct ideas around the deficit model. In this regard, an equitable balance between the use of analysis and deliberation may be deemed sufficient basis for effective stakeholder and citizen engagement.

- In situations where there is greater ambiguity around the goals and priorities for waste management, public involvement should be pursued in hope to expose dissent and disagreement between stakeholders to clear up misunderstandings and negotiate a more effective and acceptable solution. There should be more opportunities to enhance social interaction, mutual learning and trust building so as to achieve epistemic and ethical competence

in decision-making. This ought to meet expectations for a more fair and equitable decision process. In this regard, highly inclusive engagement, where interaction between participants takes the format of a partnership, may be deemed sufficient basis for effective stakeholder and citizen engagement.

The collection of opinions from the range of stakeholders has produced new insights which can contribute to a broader debate around waste management issues and the potential for early public involvement. While there remains significant uncertainty regarding what kinds of processes and technologies constitute sustainable (and deliverable) waste management strategies, and which conflicts over waste issues may be resolved through early public involvement, the research has provided a framework that practitioners may find useful in negotiating the level of public involvement where technological risks and social impacts present high levels of complexity, uncertainty or potential for controversy.

10.1: Further Research

The largely theoretical nature of the research meant that much of the focus was on the contextual issues, barriers and challenges operating in UK local authorities, thus providing insights into the methodological development of analytical-deliberative processes. There is a need for further investigation to determine what deliberative methods are best combined with analytical structures at the strategic and facility planning levels. This could be approached from the micro level and take the format of a case study to investigate what connections between analytical and deliberative elements are likely to achieve successful participation. Key questions revealed through this research (Chapter 9) relate to: (a) the diverse and competing interests around waste management issues and the potential for controversy, (b) the extent and structure of expert-citizen deliberation and the mechanism for integrating quantitative and qualitative information to enhance the participation-information quality link, and lastly (c) issues of trust and legitimacy associated with problems of social equity and fairness of process.

Additionally, there is a need to examine the value, appropriateness and practicality of analytical-deliberative processes to determine whether local authorities are

adequately equipped to adopt (and implement) a more participatory decision process. This could be approached from a macro level and, similarly take the format of a case study that focuses on the contextual influences, barriers and challenges operating in UK local authorities to provide specific insights into the methodological development of analytical-deliberation. Key questions revealed through the research (Chapter 8) relate to: (a) the epistemic/ethical competence of decision makers and decision-making, (b) the regulatory and technocratic culture of traditional decision structures, and lastly (c) the public's lack of trust in officials that represent their interests, among other social, cultural and political issues.

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Appendices

Appendices

Diagnostic Study

Interview Questions (Semi-structured)

Local waste management decision making - focus on issues affecting decisions on suitable sites and installations for treatment and disposal of municipal waste

Objectives, future vision and responsibility for change

What is your role in decision making as it relates to the development of municipal waste strategies?

Can you briefly summarise the process for developing a waste strategy.

What do you consider to be key factors in developing an effective waste strategy?

Who are the main stakeholders in this process? Are other stakeholders likely to identify similar factors as you identified? If not, can you explain why these factors tend to differ for other stakeholders?

In your opinion, what should be the 5 main objectives on the agenda of all stakeholders? Could you explain why these objectives take priority over others?

What is the most important and least important objective? How were you able to prioritise them?

By 2020, where do you expect this city to be in terms of achieving these objectives?

What changes are required to achieve these 5 objectives by 2020?

Who is responsible for leading change in the areas you mentioned? Can you explain why responsibility should be apportioned to this party?

Issues affecting decisions, likely impacts on the problem situation, possible changes and future outcomes

What do you consider to be key factors affecting decisions on suitable sites and installations for treatment or disposal of municipal waste?

From your own perspective, why do you think some citizens and environmental groups object to plans for siting and permitting treatment or disposal facilities?

How can these issues be addressed in order to minimise public opposition and reduce impacts on the planning process?

What are the expected outcomes (in the long-term) should these aspects be addressed?

Debate on deliberation and analysis, possible benefits of analytical-deliberation & expected outcomes

Can you explain how citizens and other stakeholders are involved in developing the waste strategy? (prompt: e.g. data gathering, opinion surveys, consultation, focus groups etc.)

Do you think it is possible to increase levels of involvements beyond what is currently done? (prompt: e.g. adopting citizen panels, juries or combination of methods that give some power of authority to citizens in the decision process)

In your opinion, to what level should citizens be involved in decisions related to the selection of installations for treatment and disposal of municipal waste? Can you explain why?

Do you think it is possible to establish a framework that allows citizens' views and concerns to be considered alongside more technical considerations such as regulatory benefits, environmental impacts and costs - can this be done throughout the entire decision process (prompt: deciding on the issues and objectives, initial planning and development of policy options, assessment/evaluation of options, selection of option or implementation)

What are the likely impacts and outcomes of establishing such a framework to standardise and increased public involvement in planning and decision making? (Follow-up if necessary: Can you explain why you think this?)

Waste Citizens' Panel Group Interview

Interview Guide

Topics for Discussion:

What was the purpose of consultation - did it meet your expectations?
Strategy policies and principles
Targets for recycling/composting
Options for future collection, treatment and disposal of municipal waste
Approach to selecting/designating sites for waste management (landfill and other facilities)

How were you selected for the waste focus groups - what are your thoughts about the selection process?

What was the procedure for consultation - did it meet your expectations?
Briefing
Training
Debate
Feedback

What were the main outputs of the consultation - did it meet your expectations?
Consultation analysis
Recommendations
Reporting, feedback and information dissemination
Follow up

Are you satisfied that citizen and stakeholder recommendations during consultation are reflected in current decisions/plans for waste management?

Appendix B: Questionnaire

Generic version of the questionnaire (personal details section omitted)

Sheffield Hallam University
SHARPENS YOUR THINKING

Public Involvement in Local Waste Management Decision Making

1.0 Targets for municipal waste management

In your opinion, what national targets should English local authorities achieve by 2020? Please select one of the following suggested targets or put forward your own.

The current national waste management figures for 2006/07 are provided as option 3 below.

Municipal waste management	National targets *(Please tick only ONE of the eight options below and ensure option 8 adds up to 100%)*							
	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8. Other target, please specify. ☐
i) Recycling / composting	10%	20%	31%	45%	45%	70%	95%	
ii) Landfill	70%	20%	58%	10%	10%	5%	5%	
iii) Incineration with energy recovery	0%	60%	11%	0%	45%	0%	0%	
iv) Energy recovery NOT from incineration	20%	0%	0%	45%	0%	25%	0%	

2.0 Waste management technologies

In your opinion, which technology has the most potential for handling waste left after recycling? Please rank each technology in order of its potential to be situated in your city / town AND across the region / country.

If you think two or more options have equal potential, you can show this by giving each option the same rank (e.g. option i) and option ii) could both be ranked 1 to show equal potential)

Waste management technology (A basic description of the treatment process)	Local technology (for your city / town) (1) = Most potential **(5) = Least potential**	National technology (for your region / country) (1) = Most potential **(5) = Least potential**
i) Composting This is a biological treatment process that decomposes green waste such as garden or kitchen waste in the presence of oxygen to produce compost.		
ii) Anaerobic digestion This is a biological treatment process that decomposes green waste such as garden or kitchen waste in the absence of oxygen to produce a gaseous fuel which can be converted to energy.		
iii) Mechanical biological treatment (MBT). This technology combines a waste sorting facility where waste is recycled with a form of biological treatment where waste is composted. MBTs can also process waste to produce a solid fuel (refused derived fuel) which can be converted to electric energy and heat.		
iv) Incineration Municipal waste incinerators combust waste materials at high temperatures to produce steam which can be converted to electric energy and heat.		
v) Gasification Gasification is an advanced thermal treatment process that converts waste materials into a gaseous fuel which can be used to produce energy.		

vi) Pyrolysis Pyrolysis is a chemical treatment process that converts green waste, such as garden or kitchen waste in the absence of oxygen, into a gaseous fuel which can be used to produce energy.		
vii) Plasma arc Plasma arc is a waste treatment technology that uses electrical energy and high temperature to convert waste to a gaseous fuel which can be used to produce energy.		
viii) Autoclaving The waste autoclave is a form of thermal treatment that uses heat, steam and pressure to convert municipal waste into a solid fuel (refuse derived fuel) which can be used to produce electric energy and heat.		
ix) Landfill Municipal waste landfill is a site for the disposal of waste materials by burial. The organic component of the waste is decomposed to produce a gaseous fuel which can be converted to energy.		
x) Other technologies, please specify		

3.0 Stakeholders priorities

How would you prioritize the following factors if you were asked to assess different municipal waste management technologies? Rank each factor in order of its importance to you.	(1) = Most important	(5) = Least important
If you think two or more options are equally important, you can show this by giving each option the same rank (e.g. option i) and option ii) could both be ranked 1 to show a similar level of importance)		
i) Local environmental impacts Environmental impacts such as air emissions, traffic increase and noise that affect local residents.		
ii) National environmental impacts Environmental impacts such as natural resource use and air emissions that affect the nation on a whole.		
iii) Landfill diversion targets Targets set by government for local authorities to divert waste from landfill. Local authorities face fines if they exceed the amount of waste they are allowed to landfill on a yearly basis (i.e. current fine is £32 / tonne for biodegradable waste)		
iv) Recycling targets Targets set by government for local authorities to increase recycling rates. Local authorities are legally required to meet these targets but there are no financial penalties if targets are not met		
v) Cost effectiveness The financial benefits of the waste management option (e.g. short payback period on technology investment)		
vi) Public satisfaction Local residents' satisfaction with the efficiency and cost-effectiveness of waste services (e.g. frequency of waste collection and costs to householders)		
vii) Public acceptance Local residents and general public acceptance of waste management technology (e.g. compost plant, MBT, incinerator etc.)		
viii) Political support Local councilors support of the waste policy or the waste management technology (e.g. compost plant, MBT, incinerator etc.)		
ix) Funding Funding for waste management technologies and infrastructure		
x) Length of waste contract The flexibility of long waste treatment or disposal contracts to meet higher targets for recycling (e.g. above the national average - 31%)		
xi) Planning approval A democratic planning system which delivers waste management facilities without delays		
xii) Other(s), please provide a brief explanation		

4.0 Improving deliverability of waste strategies

In your opinion, what action is most likely to improve how municipal waste strategies are delivered by local authorities?	*Please tick only ONE box for each action*				
	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
i) A broad mix of technologies for residual waste treatment approved by central government	☐	☐	☐	☐	☐
ii) A more positive national policy towards incineration with energy recovery as a source of energy production	☐	☐	☐	☐	☐
iii) Increase public education and awareness on waste reduction and recycling	☐	☐	☐	☐	☐
iv) Politicians to make long term strategic decisions that last over the lifetime of several local authority administrations	☐	☐	☐	☐	☐
v) Devolve decision making on waste management from county to town level or allow joint decision making	☐	☐	☐	☐	☐
vi) Include sites for facilities in the waste strategy	☐	☐	☐	☐	☐
vii) Introduce variable charging for waste not recycled by householders	☐	☐	☐	☐	☐
viii) A national statement on the health effects of incineration facilities	☐	☐	☐	☐	☐
ix) Develop the energy recovery potential from mechanical biological treatment (MBT)	☐	☐	☐	☐	☐
x) Independent assessment of local residual waste quantities for more accurate estimates of incineration capacities (e.g. plant size)	☐	☐	☐	☐	☐
xi) More recycling schemes that include source separation (i.e. kerbside recycling) and collection of food waste from households	☐	☐	☐	☐	☐
xii) A more equitable process for siting waste facilities (e.g. close to the point where waste is generated)	☐	☐	☐	☐	☐
xiii) Other(s), please provide a brief explanation					

5.0 Relevance of knowledge in decision making

Different types of knowledge are relevant to decision making. In your opinion, which type of knowledge is most important to municipal waste management decision making?

If you think two or more options are equally important, you can show this by giving each option the same rank (e.g. option i) and option ii) could both be ranked 1 to show a similar level of importance)

Waste strategy development	(1) = Most important	(5) =Least important
i) Expert knowledge Expert knowledge in scientific, technical, and socio-economic methods of analysis etc.		
ii) Procedural knowledge Knowledge of due process, political, legal and institutional frameworks		
iii) Local knowledge Knowledge of a particular community and locality		
iv) Other, please explain		

Facility Planning	(1) = Most important	(5) =Least important
If you think two or more options have equal potential, you can show this by giving each option the same rank (e.g. option i) and option ii) could both be ranked 1 to show equal potential)		
i) Expert knowledge Expert knowledge in scientific, technical, socio-economic methods of analysis etc.		
ii) Procedural knowledge Knowledge of due process, political, legal and institutional frameworks		
iii) Local knowledge Knowledge of a particular community and locality		
iv) Other(s), please explain		

6.0 Opinions on early public involvement

Which opinion do you most agree with on EARLY public involvement in municipal waste management decision making?	*Please tick only ONE box for each opinion*				
	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
i) It is a means to negotiate a workable, relatively fair solution that the vast majority of stakeholders can accept.	☐	☐	☐	☐	☐
ii) Involving citizens and 'non-experts' in complex decisions could create misunderstandings and misrepresentation of issues	☐	☐	☐	☐	☐
iii) It reduces opposition to waste facilities because citizens are encouraged to take joint ownership of the problem early in the process	☐	☐	☐	☐	☐
iv) It could potentially polarize opinions and provide an excuse for local authorities not to take action	☐	☐	☐	☐	☐
v) It gives the public a feeling of 'real engagement' and enhances the political or democratic process	☐	☐	☐	☐	☐
vi) It is an antidote to public meetings which can be adversarial and leave citizens feeling very frustrated and disenchanted	☐	☐	☐	☐	☐
vii) The decision regarding the type of facility, its location and the general benefit to society has to be debated by experts and politicians. In practice, citizen opinion is considered but unlikely to influence the final decision.	☐	☐	☐	☐	☐
viii) Other(s), please provide a brief explanation					

7.0 Factors affecting public involvement

In your opinion, which factors are most important in determining the level to which citizens are involved in municipal waste management decision making?	(1) = Most important	(5) = Least important
If you think two or more options are equally important, you can show this by giving each option the same rank (e.g. option i) and option ii) could both be ranked 1 to show a similar level of importance)		
i) Type of waste facility It depends on whether the facility proposed is contentious (e.g. incinerators vs. household waste recycling centre)		
ii) The local situation The sensitivity of the locality (e.g. urban vs. rural area), the history of local waste management practice and residents' opinion on waste facilities etc.		
iii) Trust in expert opinion The extent to which citizens and those in authority agree with 'expert' opinion		
iv) Costs of public engagement strategies The added costs, time and resources required for early public involvement		
v) Selection of consultees It depends on who is selected to represent local residents or general public interest		
vi) Expertise on public engagement strategies Experience and expertise on appropriate strategies and techniques for public involvement		
vii) Public stance on waste issues The public's opinion on waste issues and their willingness to negotiate their position		
viii) Public interest in waste management The extent to which the average member of the public is willing to be involved		
ix) Public knowledge and awareness of waste issues The extent to which citizens understand sustainability aspects of waste management		
x) Stage in the decision process The possibility that citizens are more likely to be engaged when sites have been identified (i.e. facility planning stage)		
xi) Other(s), please provide a brief explanation		

8.0 Level of public involvement

Which option do you most support (or agree with) for involving the public EARLY in municipal waste management decision making?

Waste strategy development	*Please tick only ONE box for each action*				
	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
i) Citizens should take part in defining objectives and criteria to identify waste management technologies	☐	☐	☐	☐	☐
ii) Citizens should take part in setting criteria to evaluate waste management technologies	☐	☐	☐	☐	☐
iii) Citizens should be consulted on a range of short listed waste management technologies	☐	☐	☐	☐	☐
iv) Other(s), please explain					

Facility Planning	*Please tick only ONE box for each action*				
	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
i) Citizens should take part in defining objectives and criteria to identify waste management technologies	☐	☐	☐	☐	☐
ii) Citizens should take part in setting criteria to evaluate waste management technologies	☐	☐	☐	☐	☐
iii) Citizens should be consulted on a range of short listed waste management technologies	☐	☐	☐	☐	☐
iv) Other(s), please explain					

9.0 Approach to early public involvement

Which approach do you most support (or agree with) for EARLY public involvement in municipal waste management decision making?

How to select consultees and when to involve them	*Please tick only ONE box for each approach*				
	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
i) Consult a small group early on and the general public after the strategy is developed	☐	☐	☐	☐	☐
ii) Consult technical experts and a representative group of the public simultaneously, early in the process (i.e. in separate parallel sessions)	☐	☐	☐	☐	☐
iii) Ensure the entire public is given a fair and equal opportunity to be involved in decision making at strategy and facility planning level	☐	☐	☐	☐	☐
iv) Include local politicians in the consultation process either by engaging them early on or alongside the general public after the strategy is developed	☐	☐	☐	☐	☐
v) Include the media in the consultation process either by engaging them early on or alongside the general public after the strategy is developed	☐	☐	☐	☐	☐
vi) Use a more structured approach to public involvement in terms of a careful selection of consultees (i.e. representative group of the public)	☐	☐	☐	☐	☐
vii) Establish community liaison groups with local residents for ongoing consultation during facility planning and construction	☐	☐	☐	☐	☐
viii) Other(s), please provide a brief explanation					

Levels of involvement and methods/techniques to adopt	*Please tick only ONE box for each approach*				
	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
i) Get residents to think about the targets for recycling and preferences for different types of technologies and collection schemes and then use that to identify the range of options	☐	☐	☐	☐	☐
ii) Give the public direction on the aims of the waste policy; educate them on the types of technologies and associated environmental impacts before soliciting their opinions	☐	☐	☐	☐	☐
iii) Local authorities and citizens should jointly select experts or be able to put forward their own independent experts whose views should be given equal weight in decision making	☐	☐	☐	☐	☐
iv) Use a select committee made up of residents, politicians, local authority officers and other stakeholders to discuss waste issues, gather evidence and jointly make decisions	☐	☐	☐	☐	☐
v) Use surveys and opinions polls for consultation on the strategy and consensus panels or focus groups for consultation on facility sites	☐	☐	☐	☐	☐
vi) Use a combination of different methods (e.g. surveys and focus groups) for consultation on the strategy and facility sites	☐	☐	☐	☐	☐
vii) Where focus groups or consensus panels are used, employ independent facilitators with experience and expertise on citizen engagement events	☐	☐	☐	☐	☐
vii) Use alternative forms of communication such as online chat networks, emails and blogs to involve the younger generation (under 24 years of age)	☐	☐	☐	☐	☐
viii) Solicit ideas from the public on the types of activities and events to involve a wider group of people	☐	☐	☐	☐	☐
ix) Other(s), please provide a brief explanation					

Other information
Please provide any other information relevant to the questions above or generally to the topic of public involvement in local waste management decision making.

Thank you for taking the time to complete this questionnaire.
Return the questionnaire:

Please email the completed questionnaire to **Kenisha Garnett** (Email: **k.garnett@shu.ac.uk**). Alternatively, you can post printed copies to Kenisha Garnett, Faculty of Organisation and Management, Sheffield Hallam University, Howard Street, S1 1WB
Save a tree and reduce energy: please don't print this form unless it is absolutely necessary.

Appendix C: Questionnaire evaluation form and feedback

Evaluation of Questionnaire

Please rate the quality of the questions on the following factors:
The questions are reflective of the aims and objectives of the research as identified in the cover letter.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
☐	☐	☐	☐	☐

The questions are clear and precise (i.e. do not require interpretation or elaboration).

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
☐	☐	☐	☐	☐

The questions asked are in a logical format (i.e. one that I could comfortably follow).

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
☐	☐	☐	☐	☐

Please respond to the following questions and provide evidence to support your response.
Did you think any of the questions were phrased to illustrate a preferred response?

Yes ☐
No ☐

If yes, could you please indicate which question(s) you found to be leading?

_____
_____

Did you think that any of the questions were repetitive?

Yes ☐
No ☐

If yes, could you please indicate which question(s) you found to be repetitive?

_____
_____

Did you find any question(s) too complicated to provide a response?

Yes ☐
No ☐

If yes, could you please indicate which question(s) you found to be complicated?

_____
_____

Please suggest any improvements that could be made to the format (or structure) and content of the questionnaire?

_____
_____

Questionnaire Evaluation: Feedback

Collation of participants' responses to the draft questionnaire

Targets for municipal waste management
Targets should be considered separately from the type of technology "I think the allocation of percentages for Mechanical Biological Treatment (MBT) is very specific, as many would see this as under an all encompassing residual treatment solution".

There is no separate consideration of two main planks of the government's waste strategy which is Combined Heat and Power (CHP) and Anaerobic Digestion for food waste collections. Both have a very important part to play.

It should be made explicit that options present the 'ideal' scenario where the waste treatment technology will handle all residual waste

The question requires specialist knowledge to make a judgement on the quantities of waste best handled through specific technologies

The options all assume a conventional mix involving some degree of energy from waste (EFW), it fails to address and open up the debate to the real alternatives being tried and tested elsewhere.

Deliverability of the waste strategy
"There are some concepts that will need explanation. For example, environmental impacts, statutory targets, landfill diversion".

Improving the deliverability of waste strategies
"Unless participants are working in the field, I do not think that they will understand what 'alternative technologies for residual waste treatment' means. Generally the language in this section needs to be simplified".

The options all assume a conventional mix involving some degree of EFW, it fails to address and open up the debate to the real alternatives being tried and tested elsewhere.

"The suggestion that 'there should be some sort of national statement on the health effects of incineration facilities' strikes me as dangerously naive. No such statement could be critical without prejudicing existing facilities. Nor could it say that all such facilities are safe. Frankly, no-one could say such a thing. No Government could ever say, in blanket terms, that they are safe, without exposing itself to risks of massive claims in litigation when things go wrong, as we know to our cost they can."

"The use of the term EFW does not clearly relate to a specific technology. It generally seems to be waste-industry term for incineration, to disguise the fact that it is neither a particularly efficient way of generating electricity nor (in the case of the incinerator proposed for our community) would it be able to utilise the waste heat produced. However, EFW can clearly be achieved in other ways, for example by Mechanical Biological Treatment followed by use of Refuse Derive Fuel in a Combined Heat and Power scheme or power station. If the intention is to talk about

incineration, I would therefore recommend using the term "municipal waste incinerator" (as is used internally by the Environment Agency). Whatever energy recovery can be achieved should be inherently part of the scheme anyway.

Summary of general comments and feedback during the pilot

Some organisations expressed an interest in receiving results of the survey but refused to respond to the questionnaire. Some government organisations felt their views on the issue were well documented in the national waste strategy and government guidance on the development of local waste strategies and did not respond on this basis. Other organisations (particularly from local authorities) felt the questionnaire was rather lengthy and they did not have the necessary resources to make a contribution. Some organisations (from the key stakeholder and citizen group) felt they did not have the necessary expertise to make to valid contribution. Others (from academia) felt the questionnaire did not convey the complexity of waste management issues and was liable to antagonise participants.

Letter to Participants

27th July 2008

Dear Sir or Madam,

You may be aware that Sheffield Hallam University is conducting research on Public Involvement in Local Waste Management. The project will develop a flexible framework to guide local authorities in effectively engaging communities and stakeholders in the development of municipal waste strategies and facility proposals.

Local authorities are searching for more effective ways to engage communities because their participation in collection schemes and acceptance of municipal waste facilities are integral to delivering effective waste strategies. The technical expertise politicians relied on in the past, to produce cost-effective and environmentally sound solutions, no longer provides sufficient justification to approve waste facilities. A balance in the use of expert and local knowledge is required to legitimise decisions. It is expected that this research will identify opportunities for legitimising municipal waste management decisions through improved dialogue and mutual understanding between policy makers, industry experts and the public.

The attached questionnaire reflects some of the current debate on public involvement in local waste management and provides a unique opportunity for your organisation to contribute to the discussion. Your views and opinions will be contrasted and compared to other stakeholders (e.g. local authority, government agencies and regulators, waste industry experts, environmental campaigners and other community groups) to highlight the key issues, potential conflicts and consensus within and across groups. The questionnaire should take approximately 40 minutes to complete, depending on your familiarity with some of the issues raised.

On completion of the survey, papers will be produced for publication in academic journals and disseminated to participants as requested. The study is the first of its kind at Sheffield Hallam University and the final report remain the property of the University. ***The project will not link organisations or individuals with data supplied and guarantees participants' confidentiality.***

Could you please complete and return the questionnaire to Kenisha Garnett at k.garnett@shu.ac.uk within the next 2 to 3 weeks of the date at the top of this letter. Alternatively you could post your completed form using the pre-paid envelope enclosed.

If you require further information or advice in completing the questionnaire, please do not hesitate to contact Kenisha Garnett (see details below).

Thank you for your participation!

Appendix E: Questionnaire Notice

Published by the Chartered Institution of Wastes Management (CIWM) and the Local Authority Research Council Initiative (LARCI).

Research on Public Involvement in Waste Management

Sheffield Hallam University is conducting research on Public Involvement in Local Waste Management. The project will develop a flexible framework to guide local authorities in effectively engaging communities and stakeholders in the development of municipal waste strategies and facility proposals.

Local authorities are searching for more effective ways to engage communities because their participation in collection schemes and acceptance of municipal waste facilities are integral to delivering waste strategies. The technical expertise politicians relied on in the past, to produce cost-effective and environmentally sound solutions, no longer provides sufficient justification to approve waste facilities. A balance in the use of expert and local knowledge is required to legitimize decisions. It is expected that this research will identify opportunities for legitimizing municipal waste management decisions through improved dialogue and mutual understanding between policy makers, industry experts and the public.

Waste management survey

The questionnaire reflects some of the current debate on public involvement in local waste management and provides a unique opportunity for your organisation to contribute to the discussion. If you would like to get your opinion across then please get in contact with:

Kenisha Garnett
Sheffield Hallam University
Tel: 0144 225 4582 (or 5257)
Email: k.garnett@shu.ac.uk
Kenisha will then email you a copy of the questionnaire and you will need to complete and return to form to Sheffield Hallam University.

Appendix F: Warrington Borough Council Article

The original article can be accessed via the link below. Last accessed on 18th November 2009 at:
http://www.warrington.gov.uk/images/citizens%20panel%20newsletter%209_tcm15-29358.pdf.

Focus Groups Summer 2007
Waste Management
In July 2007, seven members of Warrington Citizens' Panel attended a focus group discussion, which focused on public involvement in local waste management. The main aim was to discuss how local authorities effectively engage with communities and stakeholders (e.g. local authority officers, government officials, environmental campaigners) in the development of the Waste Management Strategy and facility plans. This was one of over 30 similar focus groups held throughout England, in an ongoing research project being carried out by Sheffield Hallam University.

What did the focus group tell us?
The members of the panel were asked to share their knowledge and experience of public consultation in Warrington, specifically looking at waste management. The general findings are grouped under the main themes below:

Waste policy and solutions

- Most participants felt they gained a better understanding of some of the barriers the Council faced around waste management (e.g. lack of funding; very high population and growth rate etc.) and how this impacted on what solutions were considered.
- It was felt by the participants that the Council should be allocating more funds to waste management. Another participant felt the Council needed to explain their financial constraints (i.e. whether it was in their power to double the waste management budget or get more funding from government).
- It was raised by the participants that Warrington could achieve more long term solutions to the waste problem if they collaborated with neighbouring Councils within the county of Cheshire

Public involvement

- Most participants felt the Council's approach to engage citizens had improved upon consultation involvement used in the past.
- Some participants felt the mixture of officers and independent stakeholders broadened the range of issues discussed. However, one participant felt local politicians should have been part of the process to discuss important strategic issues.
- Some participants felt that the younger generation were particularly under represented during the consultation and suggested, in the future, that the Council should run a parallel session for the younger population using more suitable forms of communication (e.g. online chat sites, emails, blogs etc.)

Important issues to have come out of the focus group:

Waste policy and solutions

Most of the discussion focused on whether incineration was contradictory with Sustainable Waste Management. Participants debated various technologies for the treatment of waste and recommendations were put forward for improving the deliverability of waste strategies.

Public involvement in decision making

Some of the findings to come out of the discussion suggest than an over-reliance on expert knowledge as the basis for decisions has the potential to cause more objections to waste facilities and create delays in the planning process. The participants agreed that early public involvement is needed, to allow citizens to negotiate interests with local authorities.

Using the focus group findings

The results from all the focus groups were complied and from this a questionnaire has been developed. The questionnaire was distributed to over 750 participants including local authority officers, government officials, waste industry representatives, environmental campaigners and community groups. This is to collect detailed information on the range of issues uncovered from the focus groups. Overall, the results will provide a better understanding on the important issue of waste management from the wider population.

New Waste management survey

If you are interested in the topic of waste management and would like to have your say, a questionnaire is being sent to a select number of Citizens' Panels or advisory groups from across England. Warrington Citizens' Panel has been chosen to be one of them.

If you would like to get your opinion across for Warrington then please get in contact with:

Kenisha Garnett
Sheffield Hallam University
Tel: 0144 225 4582 (or 5257)
Email: k.garnett@shu.ac.uk
Kenisha will then send you a copy of the questionnaire that you will need to complete and return to Sheffield Hallam University.

This is an important study and we need members from Warrington Citizens' Panel to get their opinions across. The results from this questionnaire will be available in February 2009 and will be summarised in a future panel newsletter.

Appendix G: Summary results from correlation analysis

The correlation analysis provides a measure of the extent of association between variables and is used to identify the similarities and differences in how groups ranked variables, which is explored in Chapter 7.

Grouping questions into key themes

The grouping of questions for the correlation analysis formed four themes shown below. The numbers in parenthesis indicate which questions were grouped (see questionnaire in Appendix B).

No.	Themes	Focus of grouped questions (question number)	
1.	Priorities and preferences for waste management technologies	Stakeholder priorities (3)	Waste management technologies (2)
2.	Priorities and actions to improve the deliverability of waste strategies	Stakeholder priorities (3)	Improving deliverability of waste strategies (4)
3.	Factors influencing the approach to early public involvement	Factors affecting public involvement (7)	Approach to early public involvement (9)
4.	Waste management priorities and preferred methods for early public involvement	Stakeholder priorities (3)	Approach to early public involvement (9)

Summary of results from the correlation analysis

Theme 1: Priorities and preferences for waste management technologies

Correlation between non-thermal technologies and stakeholder priorities (local)

Non thermal technologies (biodegradable waste)	Stakeholder priorities	Strength of correlation r_s (p value)	
		Key stakeholders	Citizen groups
Composting	Local environmental impacts	0.658 (0.015)	
	National environmental impacts	0.698 (0.005)	0.575 (0.051)
Anaerobic digestion	Recycling targets	-0.645 (0.024)	
	Funding		0.661 (0.052)

Correlation between thermal technologies and stakeholder priorities (local)

Thermal technologies (including advanced thermal treatment)	Stakeholder priorities	Strength of correlation r_s (p value)	
		Key stakeholders	Citizen groups
EFW Incineration	Landfill diversion targets		-0.664 (0.051)
	Public satisfaction	-0.618 (0.032)	
Gasification	National environmental impacts	-0.574 (0.051)	

Correlation between other technologies and stakeholder priorities (local)

Other technologies	Stakeholder priorities	Strength of correlation r_s (p value)		
		Local authorities	Key stakeholders	Citizen groups
Mechanical biological treatment	National environmental impacts	-0.445 (0.033)		
	Public acceptance		-0.598 (0.031)	
	Political support	0.501 (0.015)		
Autoclaving	Length of the waste contract			-0.966 (0.000)
Landfill	Recycling targets		0.677 (0.016)	
	Cost effectiveness	0.449 (0.036)		
	Funding		0.654 (0.021)	

Correlation between non-thermal technologies and stakeholder priorities (national)

Non-thermal technologies (biodegradable waste)	Stakeholder priorities	Strength of correlation r_s (p value)
		Local authorities
Anaerobic digestion	Landfill diversion targets	0.477 (0.016)

Correlation between thermal technologies and stakeholder priorities (national)

Thermal technologies (including advanced thermal treatment)	Stakeholder priorities	Strength of correlation r_s (p value)	
		Local authorities	Key stakeholders
EFW Incineration	Landfill diversion targets	0.577 (0.003)	
	Length of the waste contract	0.471 (0.027)	
Gasification	Landfill diversion targets		0.547 (0.043)
	Recycling targets	0.425 (0.038)	

Correlation between other technologies and stakeholder priorities (national)

Other technologies	Stakeholder priorities	Strength of correlation r_s (p value)		
		Local authorities	Key stakeholders	Citizen groups
Mechanical biological treatment	Public acceptance	-0.400 (0.053)		
	Political support	0.421 (0.046)		
	Funding		0.527 (0.044)	
Autoclaving	Public satisfaction	-0.447 (0.029)		
	Length of the waste contract			-0.980 (0.001)
Landfill	Local environmental impacts	0.459 (0.032)		
	Recycling targets		0.553 (0.032)	
	Political support	-0.470 (0.024)		
	Funding	-0.469 (0.028)		
	Planning approval	-0.566 (0.006)		

Theme 2: Priorities and actions to improve the deliverability of waste strategies

Correlation between actions for improving the deliverability of waste strategies and stakeholder priorities

Actions	Stakeholder priorities	Strength of correlation r_s (p value)		
		Local authorities	Key stakeholders	Citizen groups
Adopt acceptable mix of technologies	Public satisfaction		0.623 (0.017)	
Long term strategic decisions	Political support		0.531 (0.042)	
	Length of the waste contract			-0.671 (0.017)
Establish sites in waste strategy	National environmental impacts		0.746 (0.001)	
	Length of the waste contract			-0.632 (0.027)
Variable charging for householders	Landfill diversion targets		0.666 (0.009)	
	Cost-effectiveness	-0.439 (0.046)		
	Funding		0.584 (0.028)	
Develop EFW potential from MBT	Political support		0.647 (0.012)	
Source separated recycling	Public acceptance		-0.509 (0.037)	
Equitable siting process	Local environmental impacts		-0.672 (0.004)	
	Political support		-0.615 (0.015)	

Theme 3: Factors influencing the approach to early public involvement

Correlation between the approach for selecting / engaging consultees and factors affecting the extent of public involvement

Selection / engagement of consultees	Factors affecting public involvement	Strength of correlation r_s (p value)		
		Local authorities	Key stakeholders	Citizen groups
Consult a small group then the general public	Cost of public engagement strategies			0.567 (0.034)
	Expertise on public engagement	-0.436 (0.042)		
Consult public and experts together, early in the decision process	Cost of public engagement strategies	0.461 (0.031)		
	Public interest in waste management			0.557 (0.048)
Give the public equal rights to participate in decision making	Public interest in waste management		0.589 (0.027)	
Involve politicians early in the decision process	Expertise on public engagement		0.529 (0.035)	
	Public stance on waste	-0.448 (0.032)		
	Stage in the decision process			0.575 (0.025)
Use a more structured approach in terms of a careful selection of consultees	Cost of public engagement strategies	-0.484 (0.022)		
Establish community liaison group	Type of waste facility		0.576 (0.025)	-0.532 (0.028)
	The local situation		0.537 (0.032)	

Correlations between the methods / techniques for early public involvement and factors affecting the extent of involvement

Methods / techniques for early public involvement	Factors affecting of public involvement	Strength of correlation r_s (p value)		
		Local authorities	Key stakeholders	Citizen groups
Engage communities in setting waste management targets	Type of waste facility		0.599 (0.018)	
	Trust in expert opinion			0.577 (0.039)
	Cost of public engagement strategies	-0.444 (0.038)		
Authorities and public to jointly select experts	Trust in expert opinion		-0.518 (0.048)	-0.627 (0.012)
Use of joint select committees	Type of waste facility	-0.531 (0.009)		
	The local situation	-0.414 (0.050)		
	Cost of public engagement strategies		-0.490 (0.054)	

Correlations between the methods / techniques for early public involvement and factors affecting the extent of involvement (continued)

Methods / techniques for early public involvement	Factors affecting of public involvement	Strength of correlation r_s (p value)		
		Local authorities	Key stakeholders	Citizen groups
Use different methods at each decision stage	Trust in expert opinion	-0.539 (0.010)		
	Stage in the decision process	0.467 (0.025)		
Use independent facilitators	Type of waste facility	-0.543 (0.009)		
	The local situation			0.628 (0.022)
	Public interest in waste		0.624 (0.013)	

	management			
Use modern methods to engage young people	Type of waste facility		0.537 (0.048)	
	Selection of consultees	0.435 (0.038)		
	Public knowledge and awareness of waste issues			0.677 (0.008)
Solicit public ideas on how to consult	Public interest in waste management			-0.634 (0.020)

Theme 4: Waste management priorities and preferred methods for early public involvement

Selection / engagement of consultees and stakeholder priorities for waste management

Selection / engagement of consultees	Stakeholder priorities	Strength of correlation r_s (p value)		
		Local authorities	Key stakeholders	Citizen groups
Consult small group then the public	Public satisfaction		-0.812 (0.000)	
Consult public and experts together, early in the process	Cost-effectiveness	0.481 (0.023)		
	Public acceptance			0.578 (0.039)
	Political support			0.779 (0.003)
	Planning approval	0.423 (0.050)		
Involve politicians early in the decision process	National environmental impacts	0.411 (0.046)		
	Landfill diversion targets	0.417 (0.038)		
	Political support		0.540 (0.046)	

Selection / engagement of consultees and stakeholder priorities for waste management (continued)

Selection / engagement of consultees	Stakeholder priorities	Strength of correlation r_s (p value)		
		Local authorities	Key stakeholders	Citizen groups
Involve media early in the decision process	Local environmental impacts		0.570 (0.027)	
	Recycling targets		-0.570 (0.027)	
	Cost-effectiveness		0.737 (0.002)	
	Public acceptance		0.629 (0.009)	
	Political support		0.547 (0.043)	
	Planning approval		0.570 (0.027)	
Use a more structured approach in terms of a careful selection of consultees	Cost-effectiveness			0.727 (0.002)
	Political support			0.636 (0.026)
Establish community liaison groups	Length of waste contract	0.411 (0.046)		

Methods / techniques for public involvement and stakeholder priorities for waste management

Selection / engagement of consultees	Stakeholder priorities	Strength of correlation r_s (p value)		
		Local authorities	Key stakeholders	Citizen groups
Educate public then engage in debate	Public acceptance	0.410 (0.037)		
	Political support	0.408 (0.043)		
	Funding	0.414 (0.045)		
Authorities and public to jointly select experts	Recycling targets	0.427 (0.033)		
	Planning approval		0.526 (0.044)	0.775 (0.003)
Use joint select committees	Public satisfaction		-0.738 (0.003)	
	Public acceptance		-0.632 (0.009)	0.694 (0.009)
	Planning approval		-0.582 (0.023)	
Use different methods at each decision stage	Landfill diversion targets	-0.573 (0.026)		
	Funding			0.604 (0.037)
	Planning approval	0.406 (0.054)		
Use combination of different methods throughout the process	Local environmental impacts	0.408 (0.048)		
	Landfill diversion targets			-0.566 (0.022)
	Cost effectiveness	0.411 (0.051)		
	Public satisfaction			-0.540 (0.046)
Use modern methods to engage young people	Recycling targets			0.549 (0.034)
	Cost effectiveness	0.417 (0.043)		
	Public satisfaction	0.428 (0.029)		
Solicit public ideas for consultation	Funding			-0.750 (0.003)